PGP® Desktop for Windows

User's Guide

Version Information

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1 About PGP Desktop 10.0 for Windows

PGP Desktop is a security tool that uses cryptography to protect your data against unauthorized access.

PGP Desktop protects your data while being sent by email or by instant messaging (IM). It lets you encrypt your entire hard drive or hard drive partition (on Windows systems)—so everything is protected all the time—or just a portion of your hard drive, via a virtual disk on which you can securely store your most sensitive data. You can use it to share your files and folders securely with others over a network. It lets you put any combination of files and folders into an encrypted, compressed package for easy distribution or backup. Finally, use PGP Desktop to shred (securely delete) sensitive files—so that no one can retrieve them—and shred free space on your hard drive, so there are no unsecured remains of any files.

Use PGP Desktop to create PGP keypairs and manage both your personal keypairs and the public keys of others.

To make the most of PGP Desktop, you should be familiar with *PGP Desktop Terminology* (on page 13). You should also understand conventional and public-key cryptography, as described in *Conventional and Public Key Cryptography* (on page 16).

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What's New in PGP Desktop for Windows Version 10.0

Building on PGP Corporation's proven technology, PGP Desktop 10.0 for Windows includes numerous improvements and the following new and resolved features.

What's New in PGP Desktop 10.0

PGP Desktop Version 10.0.3

- This release of PGP Desktop includes resolution for minor issues. No new features are included in this release.

PGP Desktop Version 10.0.0

General

- **Additional supported operating systems**. PGP Desktop for Windows can now be installed on Windows 7.
- **New localized versions**. PGP Desktop has been localized and can now be installed in French (France) and Spanish (Latin America).
- **Support for new smart cards**. For both pre- and post-boot in PGP Desktop for Windows:
  - Axalto Cyberflex Access 32K V2 smart card
  - Giesecke and Devrient Sm@rtCafe Expert 3.2 personal identity verification cards
  - Oberthur ID-One Cosmo V5.2D personal identity verification cards
  - SafeNet iKey 2032 USB token
  - T-Systems Telesec NetKey 3.0 and TCOS 3.0 IEI cards
- **Redesigned interface**. The main user application window in PGP Desktop for Windows has been redesigned.
- **PGP Universal Server connectivity**. Increased resiliency of PGP Desktop when connectivity to the PGP Universal Server is dependent on a VPN connection or is otherwise intermittent.

PGP Keys

- **Enhanced Server Key Mode (SKM) keys**. SKM keys now include the entire key on your keyring. In addition, SKM keys can now be used for encryption functions such as disk and file encryption and decryption, as well as decrypting MAPI email messages when you are offline.
- **Keyring location**. In PGP Desktop for Windows, you can use environment variables to specify the location of your keyrings.
- **Key usage flags**. Each subkey can now have its own key usage properties, so that one subkey could be used for PGP WDE only, and another could be used for all other PGP Desktop functions. Set the key usage of a key when you want to use a key for disk encryption only but you do not want to receive encrypted email using that key.

- **Universal Server Protocol (USP) key searches**. The PGP Universal Services Protocol (USP) is a SOAP protocol operating over standard HTTP/HTTPS ports. This is now the default key lookup mechanism. If you are in a PGP Universal Server-managed environment, all key search requests as well as all other communications between the PGP Universal Server and PGP Desktop use PGP USP.

PGP Messaging

- **PGP Viewer**. Use PGP Viewer to decrypt and view legacy IMAP/POP/SMTP email messages.
- **Lotus Notes**. PGP Desktop now provides the ability to encrypt mail messages using Lotus Notes native encryption if PGP Desktop is configured to do so and the recipient is an internal Notes user.
- **Lotus Notes**. PGP Desktop now provides the ability to encrypt Lotus Notes RTF-formatted email messages using PGP/MIME, S/MIME, or PGP Partitioned formats.
- **Lotus Notes**. PGP annotations in messages now honor the regional settings for date and time stamp.
- **Microsoft Outlook buttons added**. Buttons enable you to manually add encryption and/or your digital signature to your Outlook emails. This new feature provides compliance with digital signature laws that require showing intent to sign.
- **Offline policy enhancements**. In a managed environment, mail policy is now enforced even if you are offline and not connected to the PGP Universal Server or if the server itself is offline.

PGP Portable

- Previously available as a standalone option, PGP Portable is now included in PGP Desktop. PGP Portable Disks can be created on Windows systems. This functionality requires a separate license.

PGP Whole Disk Encryption

- **Additional smart card compatibility**. New cards added for pre-boot authentication in PGP Whole Disk Encryption for Windows include Axalto Cyberflex Access 32K V2, Marx CrypToken USB token, SafeNet iKey 2032 USB token, and T-Systems T-Telesec NetKey smart card.
- **Personal Identity Verification (PIV) card support**. Support has been added in PGP Whole Disk Encryption for Windows for users with Giesecke and Devrient Sm@rtCafe Expert 3.2 and Oberthur ID-One Cosmo V5.2D personal identity verification cards.
- **Additional Keyboard Compatibility (Windows)**. A total of 50 international language keyboards can now be used to log in at PGP BootGuard. For a list of all compatible keyboards, see the PGP Desktop for Windows User's Guide or online help.

- **Full disk encryption support on Linux**. PGP WDE for Linux provides full disk encryption with pre-boot authentication on Ubuntu and Red Hat. For more information, see the PGP Whole Disk Encryption for Linux Command Line Guide.
- **Local self recovery**. PGP Desktop for Windows now provides a way for you to access your encrypted drive from the PGP BootGuard screen if you have forgotten your passphrase. When configured, you won't have to contact your administrator for assistance.
- **Multi-user enhancements**. In an environment where multiple users may access a group of computers, the PGP Universal Server administrator can define a PGP WDE Admin password. When you enter this password at the PGP BootGuard screen on a PGP Desktop for Windows system, you are prompted to enter your Windows passphrase and the disk is decrypted.
- **Force encryption enhancements**. When your PGP Universal Server administrator changes policy to require that all disks be encrypted, the next time policy is downloaded to your system, the PGP WDE assistant is displayed so you can begin to encrypt your disk.
- **Additional token support for PGP BootGuard**. The Marx CrypToken USB token can now be used at the PGP BootGuard for PGP Desktop for Windows.
- **Extended ASCII character support**. Extended ASCII characters can now be used when creating PGP WDE users.
- **Kanji characters**. Kanji characters are now displayed correctly in the PGP BootGuard screen.
- **Windows Server operating systems**. PGP WDE can now be installed on Windows Server operating systems (Windows Server 2003 and Windows Server 2008). For additional system requirements and best practices information on using PGP WDE on Windows Server systems, see *PGP KB article 1737* (http://support.pgp.com/?faq=1737).

Using this Guide

This Guide provides information on configuring and using the components within PGP Desktop. Each chapter of the guide is devoted to one of the components of PGP Desktop.

"Managed" versus "Unmanaged" Users

A PGP Universal Server can be used to control the policies and settings used by components of PGP Desktop. This is often the case in enterprises using PGP software. PGP Desktop users in this configuration are known as *managed* users, because the settings and policies available in their PGP Desktop software are pre-configured by a PGP administrator and managed using a PGP Universal Server. If you are part of a managed environment, your company may have specific usage requirements. For example, managed users may or may not be allowed to send plaintext email, or may be required to encrypt their disk with PGP Whole Disk Encryption.

Users not under the control of a PGP Universal Server are called *unmanaged* or *standalone* users.

This document describes how PGP Desktop works in both situations; however, managed users may discover while working with the product that some of the settings described in this document are not available in their environments. For more information, see *Using PGP Desktop with PGP Universal Server* (on page 309).

Note: References to PGP Universal Server-managed environments do not apply to the PGP Virtual Disk or PGP Virtual Disk Professional products.

Features Customized by Your PGP Universal Server Administrator

If you are using PGP Desktop as a "managed" user in a PGP Universal Server-managed environment, there are some settings that can be specified by your administrator. These settings may change the way features are displayed in PGP Desktop.

- **Disabled features**. Your PGP Universal Server administrator can enable or disable specific functionality. For example, your administrator may disable the ability to create PGP Zip archives, or to create PGP NetShare protected folders (on Windows systems).

  When a feature is disabled, the control item in the left side is not displayed and the menu for that feature is not available. The graphics included in this guide depict the default installation with all features enabled. The PGP Desktop interface may look different if your administrator has customized the features available.

- **Customized BootGuard**. If you are using PGP Desktop in a PGP Universal Server-managed environment, your PGP administrator may have customized the PGP Whole Disk Encryption BootGuard screen to include additional text or a custom image such as your organization's logo. The graphics included in this guide depict the default installation. Your actual login screen may look different if your administrator has customized the screen.

Conventions Used in This Guide

Notes, Cautions, and Warnings are used in the following ways.

Notes: Notes are extra, but important, information. A Note calls your attention to important aspects of the product. You will be able to use the product better if you read the Notes.

Cautions: Cautions indicate the possibility of loss of data or a minor security breach. A Caution tells you about a situation where problems could occur unless precautions are taken. Pay attention to Cautions.

Warnings: Warnings indicate the possibility of significant data loss or a major security breach. A Warning means serious problems are going to happen unless you take the appropriate action. Please take Warnings very seriously.

Who Should Read This Document

This document is for anyone who is going to be using the PGP Desktop for Windows software to protect their data.

Note: If you are new to cryptography and would like an overview of the terminology and concepts in PGP Desktop, see *An Introduction to Cryptography* (it was installed onto your computer when you installed PGP Desktop).

About PGP Desktop Licensing

A license is used within the PGP software to enable the functionality you purchased, and sets the expiration of the software. Depending on the license you have, some or all of the PGP Desktop family of applications will be active. Once you have entered the license, you must then authorize the software with PGP Corporation, either manually or online.

There are three types of licenses:

- **Evaluation**: This type of license is typically time-delimited and may not include all PGP Desktop functionality.
- **Subscription**: This type of license is typically valid for a subscription period of one year. During the subscription period, you receive the current version of PGP software and all upgrades and updates released during this period.

- **Perpetual**: This type of license allows you to use PGP Desktop indefinitely. With the addition of the annual Software Insurance policy, which must be renewed annually, you also receive all upgrades and updates released during the policy term.

Licensing PGP Desktop for Windows

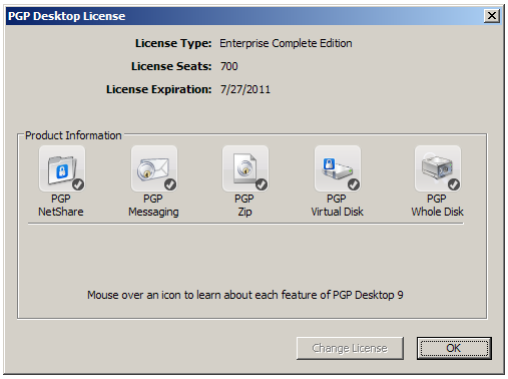
To license PGP Desktop Do one of the following:

- If you are a managed user, you are most likely already using a licensed copy of PGP Desktop. Check your license details as described in *Checking License Details* (on page 7). If you have questions, please contact your PGP administrator.
- If you are an unmanaged user, or a PGP administrator, check your license details as described in *Checking License Details* (on page 7). If you need to authorize your copy of PGP Desktop, do so as described in *Authorizing PGP Desktop for Windows* (on page 8).

Checking License Details

To see the details of your PGP Desktop license

1. Double-click the PGP Desktop icon in the system tray.
2. Select **Help > License**. The PGP Desktop License dialog box is displayed.



This dialog box displays the following details:

Item	Description
License Type	The name of the licensed product.
License Seats	The number of seats available for this license.
License Expiration	The date when the license will expire.

Item	Description
Product Information	The components that are active in your license. Move your cursor over the product name to see information about the product and to find out if you are currently licensed to use it.

Note: If you do not authorize your copy of PGP Desktop, only limited features will be available to you (PGP Zip and Keys).

Authorizing PGP Desktop for Windows

If you need to change to a new license number, or if you skipped the license authorization process during configuration, follow these instructions to authorize your software.

Note: Make sure your Internet connection is active before proceeding. If you have no Internet connection, you must submit a request for a manual authorization.

Before you begin

If you purchased PGP Desktop, you received an email order confirmation with an attached .PDF file.

1. Make a note of the name, organization, and license number you received in the email order confirmation. These are shown in the section titled **Important Note** in the .PDF. You will need these details during the licensing process.

   During configuration of your PGP Desktop software, you must type the name, organization, email address, and license number to authorize your copy of PGP Desktop with PGP Corporation's authorization server.

   Note: Your license number also appears on the download page of your PGP product.

   Double-click the PGP Desktop icon in the System Tray.
2. Select **Help** > **License**. The PGP Desktop License dialog box is displayed.
3. Click **Change License**. The PGP Licensing Assistant dialog box is displayed.
4. Type the **Name** and **Organization** exactly as specified in your PGP email order confirmation .PDF. These will be shown in the section titled **Important Note** in the .PDF. If the **Important Note** section does not exist in your .PDF, your first authorization attempt will set the name and organization permanently.
5. Type the email address you want to assign to the licensing of the product.

6 Type the email address again to confirm it.

Note: If you have previously authorized the same license number, you must enter the same Name, Organization, and Email Address as you did the previous time. If you enter different information, authorization will fail.

7 Click **Next**.

8 Do one of the following:

- Type your 28-character license number in the provided fields (for example, DEMO1-DEMO2-DEMO3-DEMO4-DEMO5-ABC).

Note: To avoid typing errors and make the authorization easier, copy the entire license number, put the cursor in the first "License Number" field, and paste. Your license number will be correctly entered into all six "License Number" fields.

- To request a one-time, 30-day evaluation of PGP Desktop, select **Request a one-time 30 day Evaluation of PGP Desktop**. When you purchase a license, you can enter it any time before the end of the 30-day evaluation period. If you don't enter a valid license, PGP Desktop will revert to unlicensed functionality when the 30-day evaluation period is over.
- To purchase a PGP Desktop license, select **Purchase a license number now.** A Web browser will open and take you to the online PGP Store.
- To use PGP Desktop without a license, select **Use without a license and disable most functionality**. The only feature of PGP Desktop you can use without a license is PGP Zip and Keys.

9 Click **Next** to authorize.

10 When PGP is authorized, the features enabled by your license will be displayed. Click **Next**, and then click **Finish** to complete the process.

Resolving License Authorization Errors

If you receive any error messages while authorizing your software, the ways to resolve this issue vary based on the error message. See the *HOWTO: License PGP Desktop 9.x* section in the *PGP Support Portal* (https://support.pgp.com) for suggestions.

If Your License has Expired

If your PGP Desktop license has expired, you will receive a PGP License Expiration message when you launch PGP Desktop. See the following sections for information on how an expired license affects the functionality of PGP Desktop.

PGP Desktop Email

- Outgoing email messages are no longer sent encrypted.

PGP NetShare

- PGP NetShare protected folders can be accessed however the protected files remain encrypted. (To view the encrypted files, manually decrypt the folders and files.)
- New PGP NetShare protected folders cannot be created.
- Files moved into a protected folder are not encrypted.
- Keys cannot be added or removed from PGP NetShare protected folders.

PGP Virtual Disk

- PGP Virtual Disks are still accessible in Read-Only mode. Read-Only allows data to be copied from a PGP Virtual Disk, however no data can be copied to a PGP Virtual Disk.

PGP Whole Disk Encryption

- Any fixed disks that have been encrypted with PGP Desktop are automatically decrypted 90 days after the license expiration date.

Getting Assistance

For additional resources, see these sections.

Getting product information

Unless otherwise noted, online help is installed and is available within the PGP Desktop product. Release notes are also available, which may have last-minute information not found in the product documentation. The users guide and quick start guides, provided as Adobe Acrobat PDF files, are available on the *PGP Corporation Support Portal* (https://support.pgp.com).

Once PGP Desktop is released, additional information regarding the product is entered into the online Knowledge Base available on the *PGP Support Knowledge Base* (https://support.pgp.com/?faq=589).

Contact Information

Contacting Technical Support

- To learn about PGP support options and how to contact PGP Technical Support, please visit the *PGP Corporation Support Home Page* (https://support.pgp.com).
- To access the PGP Support Knowledge Base or request PGP Technical Support, please visit *PGP Support Portal Web Site* (https://support.pgp.com). **Note that you may access portions of the PGP Support Knowledge Base without a support agreement; however, you must have a valid support agreement to request Technical Support.**
- To access the PGP Support forums, please visit *PGP Support* (http://forum.pgp.com). These are user community support forums hosted by PGP Corporation.

Contacting Customer Service

- For help with orders, downloads, and licensing, please visit *PGP Corporation Customer Service* (https://pgp.custhelp.com/app/cshome).

Contacting Other Departments

- For any other contacts at PGP Corporation, please visit the *PGP Contacts Page* (http://www.pgp.com/about_pgp_corporation/contact/index.html).
- For general information about PGP Corporation, please visit the *PGP Web Site* (http://www.pgp.com).

2 PGP Desktop Basics

This section describes the PGP Desktop terminology and provides some high-level conceptual information on cryptography.

In This Chapter

PGP Desktop Terminology 13
Conventional and Public Key Cryptography 16
Using PGP Desktop for the First Time 17

PGP Desktop Terminology

To make the most of PGP Desktop, you should be familiar with the terms in the following sections.

PGP Product Components

PGP Desktop and its components are described in the following list. Depending on your license, you may not have all functionality available. For more information, see *About PGP Desktop Licensing* (see "Licensing PGP Desktop for Windows" on page 7).

- **PGP Desktop**: A software tool that uses cryptography to protect your data against unauthorized access. PGP Desktop is available for Mac OS X and Windows.
  - **PGP Messaging**: A feature of PGP Desktop that automatically and transparently supports all of your email clients through policies you control. PGP Desktop accomplishes this using a new proxy technology; the older plug-in technology is also available. PGP Messaging also protects many IM clients, such as AIM and iChat (both users must have PGP Messaging enabled).
  - **PGP Whole Disk Encryption**: Whole Disk Encryption is a feature of PGP Desktop that encrypts your entire hard drive or partition (on Windows systems), including your boot record, thus protecting all your files when you are not using them. You can use PGP Whole Disk Encryption and PGP Virtual Disk volumes on the same system. On Windows systems, you can protect whole disk encrypted drives with a passphrase or with a keypair on a USB token for added security.

- **PGP NetShare**: A feature of PGP Desktop for Windows with which you can securely and transparently share files and folders among selected individuals. PGP NetShare users can protect their files and folders simply by placing them within a folder that is designated as protected.
- **PGP Keys**: A feature of PGP Desktop that gives you complete control over both your own PGP keys, and the keys of those persons with whom you are securely exchanging email messages.
- **PGP Virtual Disk volumes**: PGP Virtual Disk volumes are a feature of PGP Desktop that let you use part of your hard drive space as an encrypted virtual disk. You can protect a PGP Virtual Disk volume with a key or a passphrase. You can even create additional users for a volume, so that people you authorize can also access the volume. The PGP Virtual Disk feature is especially useful on laptops, because if your computer is lost or stolen, the sensitive data stored on the PGP Virtual Disk is protected against unauthorized access.
- **PGP Shred**: A feature of PGP Desktop that lets you securely delete data from your system. PGP Shred overwrites files so that even file recovery software cannot recover them.
- **PGP Viewer**: Use PGP Viewer decrypt, verify, and display messages *outside* the mail stream
- **PGP Zip**: A feature of PGP Desktop that lets you put any combination of files and folders into a single encrypted, compressed package for convenient transport or backup. You can encrypt a PGP Zip archive to a PGP key or to a passphrase.

- **PGP Universal**: A tool for enterprises to automatically and transparently secure email messaging for their employees. If you are using PGP Desktop in a PGP Universal Server-managed environment, your messaging policies and other settings may be controlled by your organization's PGP administrator.
  - **PGP Global Directory**: A free, public keyserver hosted by PGP Corporation. The PGP Global Directory provides quick and easy access to the universe of PGP keys. It uses next-generation keyserver technology that queries the email address on a key (to verify that the owner of the email address wants their key posted) and lets users manage their own keys. Using the PGP Global Directory significantly enhances your chances of finding a valid public key of someone to whom you want to send secured messages. PGP Desktop is designed to work closely with the PGP Global Directory.

Terms Used in PGP Desktop

Before you use PGP Desktop, you should be familiar with the following terms:

- **Decrypting:** The process of taking encrypted (scrambled) data and making it meaningful again. When you receive data that has been encrypted by someone using your public key, you use your private key to decrypt the data.
- **Encrypting:** The process of scrambling data so that if an unauthorized person gets access to it, they cannot do anything with it. The data is so scrambled, it's meaningless.
- **Signing:** The process of applying a digital signature to data using your private key. Because data signed by your private key can be verified only by your public key, the ability to verify signed data with your public key proves that your private key signed the data and thus proves the data is from you.
- **Verifying:** The process of proving that the private key was used to digitally sign data by using that person's public key. Because data signed by a private key can only be verified by the corresponding public key, the fact that a particular public key can verify signed data proves the signer was the holder of the private key.
- **Keypair:** A private key/public key combination. When you create a PGP "key", you are actually creating a keypair. As your keypair includes your name and your email address, in addition to your private and public keys, it might be more helpful to think of your keypair as your digital ID—it identifies you in the digital world as your driver's license or passport identifies you in the physical world.
- **Private key:** The key you keep very, very private. Only your private key can decrypt data that was encrypted using your public key. Also, only your private key can create a digital signature that your public key can verify.

  Caution: Do not give your private key, or its passphrase, to anyone! And keep your private key safe.

- **Public key:** The key you distribute to others so that they can send protected messages to you (messages that can only be decrypted by your private key) and so they can verify your digital signature. Public keys are meant to be widely distributed.

  Your public and private keys are mathematically related, but there's no way to figure out your private key if someone has your public key.
- **Keyserver:** A repository for keys. Some companies host keyservers for the public keys of their employees, so other employees can find their public keys and send them protected messages. The *PGP Global Directory* (https://keyserver.pgp.com) is a free, public keyserver hosted by PGP Corporation.

- **Smart cards and tokens:** Smart cards and tokens are portable devices on which you can create your PGP keypair or copy your PGP keypair. Creating your PGP keypair on a smart card or token adds security by requiring possession of the smart card or token in order to encrypt, sign, decrypt, or verify. So even if an unauthorized person gains access to your computer, your encrypted data is secure because your PGP keypair is with you on your smart card or token. Copying your PGP keypair to a smart card or token is a good way to use it away from your main system, back it up, and distribute your public key. Smart cards and tokens are not available for key storage when used with PGP Desktop for Mac OS X.

Conventional and Public Key Cryptography

Conventional cryptography uses the same passphrase to encrypt and decrypt data. Conventional cryptography is great for data that isn't going anywhere (because it encrypts and decrypts quickly). However, conventional cryptography is not as well suited for situations where you need to send encrypted data to someone else, especially if you want to send encrypted data to someone you have never met.

Public-key cryptography uses two keys (called a keypair) for encrypting and decrypting. One of these two keys is your private key; and, like the name suggests, you need to keep it private. Very, very private. The other key is your public key, and, like its name suggests, you can share it with the general public. In fact, you're supposed to share.

Public-key cryptography works this way: let's say you and your cousin in another city want to exchange private messages. Both of you have PGP Desktop. First, you both need to create your keypair: one private key and one public key. Your private key you keep secret, your public key you send to a public keyserver like the PGP Global Directory (keyserver.pgp.com), which is a public facility for distributing public keys. (Some companies have their own private keyservers.)

Once the public keys are on the keyserver, you can go back to the keyserver and get your cousin's public key, and she can go to the keyserver and get yours (there are other ways to exchange public keys; for more information, see *Working with PGP Keys* (on page 41)). This is important because to send an encrypted email message that only your cousin can decrypt, you encrypt it using your cousin's public key. What makes this work is that only your cousin's private key can decrypt a message that was encrypted using her public key. Even you, who have her public key, cannot decrypt the message once it has been encrypted using her public key. **Only the private key can decrypt data that was encrypted with the corresponding public key.**

Your public and private keys are mathematically related, but there's no feasible way to figure out someone's private key if you just have a public key.

Learning More About Cryptography

For more information about cryptography, see *An Introduction to Cryptography*, which was installed on your system when PGP Desktop was installed. It is available through the Start menu.

Using PGP Desktop for the First Time

PGP Corporation recommends the following procedure for getting started with PGP Desktop:

1 **Install PGP Desktop on your computer.**

If you are a corporate user, your PGP administrator may have specific installation instructions for you to follow or may have configured your PGP installer with certain settings. Either way, this is the first step.

2 **Let the Setup Assistant be your guide.**

To help you get started, after you install PGP Desktop and reboot your computer, the Setup Assistant is displayed. It assists with:

- Licensing PGP Desktop
- Creating a keypair—with or without subkeys (if you do not already have a keypair).
- Publishing your public key on the PGP Global Directory.
- Enabling PGP Messaging
- Giving you a quick overview of other features.

If your PGP Desktop installer application was configured by a PGP administrator, the Setup Assistant may perform other tasks.

3 **Exchange public keys with others.**

After you have created a keypair, you can begin sending and receiving secure messages with other PGP Desktop users (once you have exchanged public keys with them). You can also use the PGP Desktop disk-protection features.

Exchanging public keys with others is an important first step. To send them secure messages, you need a copy of their public key, and to reply with a secure message, they need a copy of your public key. If you did not upload your public key to the PGP Global Directory using the Setup Assistant, do so now. If you do not have the public key for someone to whom you want to send messages, the PGP Global Directory is the first place to look. PGP Desktop does this for you—when you send email, it finds and verifies the keys of other PGP Desktop users automatically. It then encrypts your message to the recipient public key, and sends the message.

4 **Validate the public keys you get from untrusted keyservers.**

When you get a public key from an untrusted keyserver, try to make sure that it has not been tampered with, and that the key really belongs to the person it names. To do this, use PGP Desktop to compare the unique fingerprint on your copy of someone's public key to the fingerprint on that person's key (a good way to do that is by telephoning the key's owner and having them read you the fingerprint information so that you can compare it). Keys from trusted keyservers like the PGP Global Directory have already been verified.

5 **Start securing your email, files, and instant message (IM) sessions.**

After you have generated your keypair and exchanged public keys, you can begin encrypting, decrypting, signing, and verifying email messages and files. The secure IM chat session feature generates its own keys automatically, so you can use this feature even before you generate your keypair. The only requirement is that you must be chatting with another PGP Desktop user for the chat session to be secured.

6 **Watch for information boxes from the PGP Desktop Notifier feature to appear**.

As you send or receive messages, or perform other PGP Desktop functions, the PGP Desktop Notifier feature displays information boxes that appear in whichever corner of the screen you specify. These PGP Notifier boxes tell you the action that PGP Desktop took, or will take. After you grow familiar with the process of sending and receiving messages, you can change options for the PGP Notifier feature—or turn it off.

7 **After you have sent or received some messages, check the logs to make sure everything is working correctly.**

If you want more information than the Notifier feature displays, the PGP Log provides detailed information about all messaging operations.

8 **Modify your messaging policies, if necessary.**

Email messages are sent and received—automatically and seamlessly—if PGP Desktop messaging policies are configured correctly. If your message recipient has a key on the PGP Global Directory the default PGP Desktop policies provide *opportunistic* encryption. Opportunistic encryption means that, if PGP Desktop has what it needs (such as the recipient's **verified** public key) to encrypt the message automatically, then it does so. Otherwise, it sends the message in *clear text* (unencrypted). The default PGP Desktop policies also provide optional *forced* encryption. This means that, if you include the text "[PGP]" in the Subject line of a message, then the message **must** be sent securely. If verified keys cannot be found, then the message is not sent, and a Notifier box alerts you.

9 **Start using the other features in PGP Desktop.**

Along with its messaging features, you can also use PGP Desktop to secure the disks that you work with:

- Use **PGP Whole Disk Encryption** to encrypt a boot disk, disk partition (on Windows systems), external disk, or USB thumb drive. All files on the disk or partition are secured — encrypted and decrypted on the fly as you use them. The process is completely transparent to you.
- Use **PGP Virtual Disk** to create a secure "virtual hard disk." You can use this virtual disk like a bank vault for your files. Use PGP Desktop or Windows Explorer or the Mac OS X finder to unmount and lock the virtual disk, and your files are secure, even if the rest of your computer is unlocked.
- Use **PGP Zip** to create compressed and encrypted PGP Zip archives. These archives offer an efficient way to transport or store files securely.
- Use **PGP Shredder** to delete sensitive files that you no longer need. PGP Shredder removes them completely, eliminating any possibility of recovery.
- Use **PGP NetShare** to share files and folders securely and easily among any number of people—with maximum access control.

3 Installing PGP Desktop

This section describes how to install PGP Desktop onto your computer and how to get started after installation.

In This Chapter

Before You Install....21
Installing and Configuring PGP Desktop....22
Uninstalling PGP Desktop....26
Moving Your PGP Desktop Installation From One Computer to Another26

Before You Install

This section describes the minimum system requirements for installing PGP Desktop on your Windows computer.

System Requirements

Before you begin the installation, verify that your system meets these minimum requirements:

- Microsoft Windows 2000 (Service Pack 4),Windows Server 2003 (Service Pack 1 and 2), Windows XP Professional 32-bit (Service Pack 2 or 3), Windows XP Professional 64-bit (Service Pack 2), Windows XP Home Edition (Service Pack 2 or 3), Microsoft Windows XP Tablet PC Edition 2005 (requires attached keyboard), Windows Vista (all 32- and 64-bit editions, including Service Pack 1 and 2), Windows 7 (all 32- and 64-bit editions).

  Note: The above operating systems are supported only when all of the latest hot fixes and security patches from Microsoft have been applied.

  PGP Whole Disk Encryption (WDE) is supported on all client versions above as well as the following Windows Server versions:

  - Windows Server 2003 SP 2 (32- and 64-bit editions)
  - Windows Server 2008 SP 1 and 2 (32- and 64-bit editions)
  - Windows Server 2008 R2 (32- and 64-bit editions)

For additional system requirements and best practices information on using PGP WDE on Windows Server systems, see *PGP KB article 1737* (http://support.pgp.com/?faq=1737).

- 512 MB of RAM
- 64 MB hard disk space

For information on compatible email, instant messaging, and anti-virus software, see the *PGP Desktop10.0 for Windows Release Notes*.

Citrix and Terminal Services Compatibility

PGP Desktop for Windows has been tested with the following terminal services software:

- Citrix Presentation Server 4.0
- Citrix Metaframe XP
- Windows 2003 Terminal Services

The following features of PGP Desktop for Windows are available in these environments, as specified:

- Email encryption is fully supported.
- PGP Zip functionality is fully supported.
- PGP Shred functionality is fully supported.
- PGP NetShare is fully supported.
- PGP Virtual Disks cannot be mounted at a drive letter over Citrix/TS, but can be mounted at directory mount points on NTFS volumes.
- PGP Whole Disk Encryption is not supported.
- Smart cards are not supported.

For information on how to install PGP Desktop on a Citrix server, see *PGP Support KB Article 832* (https://support.pgp.com/?faq=832).

Installing and Configuring PGP Desktop

This section includes information on installing or upgrading PGP Desktop, as well as information on the Setup Assistant.

Installing the Software

Note: You must have administrative rights on your system in order to install PGP Desktop.

▸ **To install PGP Desktop on your Windows system**

1. Locate the PGP Desktop installation program. The installer program is an .MSI file, which your PGP administrator may have distributed to you using the Microsoft SMS deployment tool.
2. Double-click the PGP Desktop installer.
3. Follow the on-screen instructions.
4. If prompted to do so, restart your system.

Note: If you are in a domain protected by a PGP Universal Server, your PGP administrator may have preconfigured your PGP Desktop installer with specific features and/or settings. In addition, if your PGP administrator set up silent enrollment, your Windows domain password will be used for all passphrase requirements in PGP Desktop. If specified by policy, PGP Whole Disk Encryption may automatically start to encrypt your disk when your Windows password is entered.

Upgrading the Software

Note: PGP Desktop for Windows and PGP Universal Satellite for Windows cannot both be installed on the same system. The installation programs for both products detect the presence of the other program and end the installation process if the other product is found.

You can upgrade to PGP Desktop for Windows from a previous version of one of the following products:

- PGP Desktop for Windows
- PGP Universal Satellite for Windows

If you are using Microsoft Windows XP with your computer, you can upgrade only to PGP Desktop 9.6 or later from PGP Desktop 8.x. If you are using a Microsoft Windows 2000 system, you can upgrade from PGP Desktop Versions 6.x, 7.x, or 8.x.

Important Note: If you are upgrading your computer to a new version of the operating system and want to use this version of PGP Desktop, be sure to uninstall any previous versions of PGP Desktop before upgrading the OS and installing this release. Be sure to back up your keys and keyrings before uninstalling. Note that if you have used PGP Whole Disk Encryption, you will need to unencrypt your disk before you can uninstall PGP Desktop.

Upgrading PGP Desktop

Do one of the following:

- **From PGP Desktop 8.x for Windows:** Follow the standard installation process for PGP Desktop 10.0 for Windows.

  PGP Desktop for Windows 8.x is automatically uninstalled, and PGP Desktop 10.0 for Windows is installed. Existing keyrings and PGP Virtual Disk files are usable in the upgraded version.

- **From a version of PGP Desktop for Windows** *prior* **to 8.0:** Manually uninstall versions of PGP Desktop prior to 8.0 before beginning the installation of PGP Desktop 10.0 for Windows. Existing keyrings and PGP Virtual Disk files will be usable in the upgraded version.

Upgrading from PGP Universal Satellite

Do one of the following:

- **From PGP Universal Satellite 1.2 for Windows or previous:** Follow the installation process for PGP Desktop 10.0 for Windows.

  Existing versions of PGP Universal Satellite for Windows are automatically uninstalled, and PGP Desktop 10.0 for Windows will be installed. Existing settings will be retained.

  Caution: Installing any version of PGP Universal Satellite on top of PGP Desktop 10.0 for Windows is an unsupported configuration. Neither program will work correctly. Uninstall both programs and then install only PGP Desktop.

- **From PGP Desktop for Windows (Version 8.x) and PGP Universal Satellite:** Follow the installation process for PGP Desktop 10.0 for Windows.

  PGP Desktop and PGP Universal Satellite for Windows are automatically uninstalled, and then PGP Desktop 10.0 for Windows is installed. Existing keyrings and PGP Virtual Disk files are usable in the upgraded version.

Checking for Updates

When enabled, PGP Desktop checks for software updates automatically at the specified interval. The default is one day. If a newer version of PGP Desktop is available for download, a notification screen is displayed that lets you download the new version. When disabled, PGP Desktop does not automatically check for software updates. For more information, see *General Options* (on page 282).

Once you have downloaded the update, install the update by following the prompts.

This option requires an active Internet connection.

Note: If you are using PGP Desktop in a PGP Universal Server-managed environment, this option may be required. PGP Desktop then searches for updates on its associated PGP Universal Server.

Note: You must have administrative rights on your system in order to install the update.

Upgrading From Standalone to Managed PGP Desktop Installations

If you have been using PGP Desktop in standalone mode and now will be managed by a PGP Universal Server, you must install a bound and stamped version of PGP Desktop over your existing, standalone installation. You must also complete the enrollment process. Your PGP Administrator will provide an installation file so you can install a bound and stamped version.

Upgrading the Operating System Software

If you are upgrading your computer to a new major release of the operating system (for example, on a Windows system to Windows Vista or on a Mac OS X system from 10.4.x to 10.5.x), be sure to do the following:

1. Back up your keys and keyrings before uninstalling.
2. If you have used PGP Whole Disk Encryption, dencrypt your disk before you uninstall PGP Desktop.
3. Uninstall any previous versions of PGP Desktop *before* upgrading to the new version of the operating system.
4. Once you have upgraded your version of the operating system, reinstall PGP Desktop. Import your keys/keyring and, if necessary, you can then encrypt your disk.

Licensing PGP Desktop

For license information for this release, see the *PGP Desktop Release Notes*.

Running the Setup Assistant

When the installation of PGP Desktop is complete, you are prompted to restart your computer. Once the computer restarts, as soon as you see the Windows Desktop, the PGP Desktop Setup Assistant starts automatically. The Setup Assistant displays a series of screens that ask you questions—then uses your answers to configure PGP Desktop for you.

Based on a number of factors, the Setup Assistant for your system contains only those screens that are appropriate for your installation.

The Setup Assistant does not configure all PGP Desktop settings. When you finish going through the Setup Assistant screens, you can then configure those settings not covered in the Setup Assistant.

Uninstalling PGP Desktop

You can uninstall PGP Desktop using the PGP Desktop uninstaller, or by using Windows' **Add or Remove Programs** feature. The following procedure describes using the PGP Desktop uninstaller directly.

If you are upgrading from PGP Desktop 8.x or later, you do **not** have to uninstall PGP Desktop first. For more information, see *Upgrading the Software* (on page 23).

To uninstall PGP Desktop

1. Click the **Start** menu and select **Programs > PGP > Uninstall PGP Desktop.** A confirmation dialog box is displayed.
2. Click **Yes** to continue with the uninstall process. The PGP Desktop software is removed from your system.

   Keyring, PGP Virtual Disk, and PGP Zip (`.pgp`) files are *not* removed from your system, in case you decide to reinstall PGP Desktop in the future.
3. If prompted, restart your computer to complete the uninstall process.

Note: An alternative to uninstalling PGP Desktop is stopping PGP Desktop background services. Doing this prevents PGP Desktop from protecting your email and instant messages, but both PGP Virtual Disk volumes and disks or partitions protected by PGP Whole Disk Encryption are still accessible. If you just need to turn off the PGP Desktop email or IM proxies, you can do that in the PGP Options dialog box (select **Tools > Options**, click the Messaging tab, and deselect the options as needed).

Moving Your PGP Desktop Installation From One Computer to Another

Moving a PGP Desktop installation from one computer to another is not a difficult process, although there are a few crucial steps which must be completed successfully. The process consists of the following steps:

To transfer your PGP Desktop installation to another computer

1. Uninstall PGP Desktop. To do this, choose **Start > Programs > PGP > Uninstall PGP Desktop**. You can also use the Add/Remove Programs functionality in the Windows Control Panel, which is the only way to remove PGP Desktop if you are running an older version of the program.

   Note that this step does not remove the keyring files.

2. Transfer the keyrings. To do this, copy the keyring files (both `pubring.pkr` and `secring.skr`) from the old computer to diskette or other removable media, and then copy them to the new computer. The default location for the keyring files is C:\Documents and Settings\<user>\My Documents\PGP\.

   If PGP Desktop has never been installed on the new computer, create this folder first before copying the keyring files to the computer.

3. Install PGP Desktop on the new computer. To do this, download PGP Desktop by clicking the download link in your original PGP Corporation order confirmation email.

4. During the installation process, do the following:

   - During the PGP Desktop setup wizard on the new computer select **No, I have existing keyrings** and specify the location where you copied the keyring files to on the new computer.
   - Use the same name, organization, and license number used when PGP Desktop was originally authorized.

4 The PGP Desktop User Interface

This section describes the PGP Desktop user interface.

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Accessing PGP Desktop Features 29
PGP Desktop Notifier alerts 34
Viewing the PGP Log 39

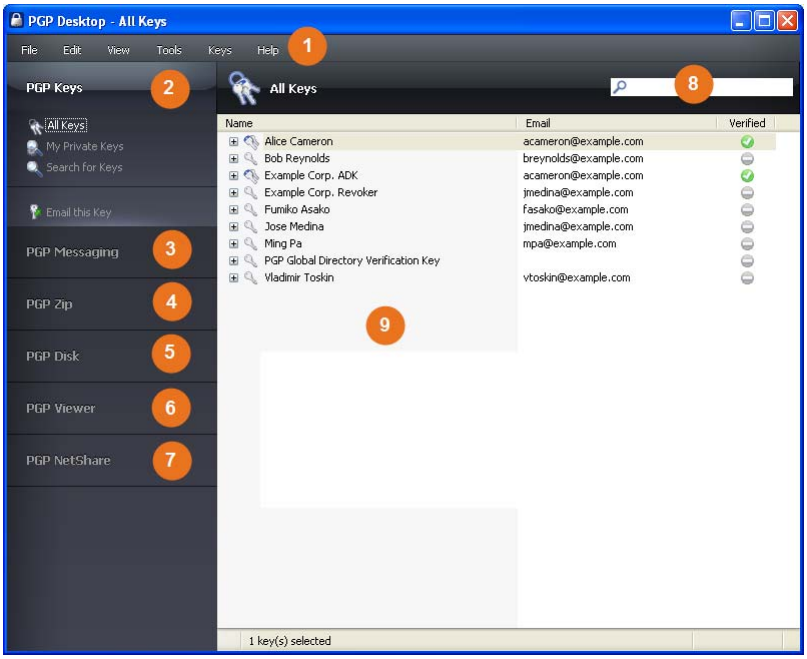
Accessing PGP Desktop Features

There are four main ways to access PGP Desktop:

- *PGP Desktop Main Window* (see "The PGP Desktop Main Screen" on page 30)
- *PGP Tray Icon* (see "Using the PGP Tray Icon" on page 31)
- *Shortcut Menus in Windows Explorer* (see "Using Shortcut Menus in Windows Explorer" on page 33)
- *Start Menu* (see "Using the Start Menu" on page 34)

The PGP Desktop Main Screen

The main screen of PGP Desktop is your primary interface to the product.



The PGP Desktop main screen includes:

1	**The Menu bar**. Gives you access to PGP Desktop commands. The menus on the Menu bar change depending on which Control box is selected.
2	**The PGP Keys Control Box**. Gives you control of PGP keys.
3	**The PGP Messaging Control Box**. Gives you control over PGP Messaging.
4	**The PGP Zip Control Box**. Gives you control of PGP Zip, as well as the PGP Zip Assistant, which helps you create new PGP Zip archives.
5	**The PGP Disk Control Box**. Gives you control of PGP Disk.
6	**The PGP Viewer Control Box**. Gives you the ability to decrypt, verify, and display messages *outside* the mail stream.
7	**The PGP NetShare Control Box**. Gives you control of PGP NetShare.
8	**The PGP Desktop Work area**. Displays information and actions you can take for the selected Control box.

9 **PGP Keys Find box.** Use to search for keys on your keyring. As you type text in this box, PGP Desktop displays search results based on either name or email address.

Each Control box expands to show available options, and collapses to save space (only the Control Box's banner displays). Expand a Control Box by clicking its banner.

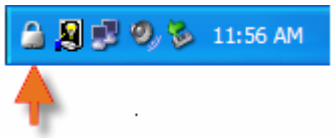
When expanded, the contents of Control Boxes change depending on what is appropriate for what you are working on, or what is selected. For example, when the PGP Keys Control Box is selected, if a public key is selected, the options **Email this Recipient** and **Email this Key** appear at the bottom of the PGP Keys Control Box. If a private key is selected, only **Email this Key** is displayed. If no key is selected, neither option is displayed.

To navigate around the PGP Desktop main screen, use the Tab key. Then use the Space key or Enter to select an option.

Note: Click **Email this Recipient** to open your system's default email client and create a new email using the address of the selected key. This makes it easy to send a message to someone on your keyring. Click **Email this Key** to open your system's default email client and create a new email with the selected public key attached (the message is not addressed). This is useful for sending your public key, or a public key on your keyring, to someone who does not already have it.

Using the PGP Tray Icon

One way to access many PGP Desktop features is from the PGP Tray icon.



Tip: You can open PGP Desktop by double-clicking the PGP Tray icon.

The PGP Tray displays one of four icons:

- **Normal operation** (): PGP Desktop is operating normally; no passphrases are cached, message proxying is enabled, no other PGP operations are in progress.
- **Cached passphrase** (): PGP Desktop is operating normally; additionally, one or more private key passphrases has been cached. Caching passphrases is an optional time-saving feature, in that you don't have to type your passphrase if it's cached to sign a key, for example, but it's also a security risk in that if you leave your system with the passphrase cached, whoever walks up to your system could use PGP Desktop without having to type the appropriate passphrase.

- **Message proxying disabled** ( ): Proxying of email messages has been disabled; incoming encrypted messages will not be decrypted or verified and outgoing messages will not be encrypted or signed. You can turn message proxying back on using the PGP Tray menu or the PGP Options.
- **Busy** ( ): PGP Desktop is in the middle of an operation, such as encrypting a disk. When the operation is complete, the PGP Tray icon changes back to the appropriate icon.

When you right- or left-click on the PGP Tray icon, a menu is displayed giving you access to various options. Note that not all options may be available, depending on if you are a standalone or managed installation.

- **Exit PGP Services**. Stops PGP Desktop services on this computer. Be very careful with this command; it will stop automatic encryption and decryption of email and instant messaging sessions.

  If you stop the PGP Services, you can start them again by restarting your computer or by selecting PGP Desktop from the Start menu (**Start > Programs > PGP > PGP Desktop**).
- **About PGP Desktop**. Displays information about the version of PGP Desktop you are using, including licensing information.
- **Check for Updates**. Contacts the PGP Corporation update server to see if a newer version of PGP Desktop is available for download. This option is available only in standalone installations.
- **Help**. Opens PGP Desktop's integrated online help.
- **Options**. Opens the PGP Desktop Options dialog.
- **View Notifier**. Displays the last incoming and outgoing message notifiers.
- **View PGP Log**. Displays the PGP Desktop Log. Use the PGP Desktop Log to see what actions PGP Desktop is taking to secure your data.
- **Open PGP Viewer**. Opens PGP Viewer so you can decrypt email out of the mail stream.
- **Open PGP Desktop**. Opens the PGP Desktop main screen. You can also open PGP Desktop by *double-clicking* the PGP Desktop Tray icon.
- **Update Policy**. Manually downloads policy from the PGP Universal Server. This option is available only for managed installations.
- **Clear Caches**. Clears from memory any cached information, such as passphrases and cached public keys.

  Note: A cached passphrase is not cleared if you used a smart card or token to access a PGP NetShare protected folder, and removed the smart card or token. To clear a cached passphrase, create a hot key. For more information, see *Advanced Options* (on page 299).
- **Unmount PGP Virtual Disks**. Unmounts all mounted PGP Virtual Disk volumes.

- **Current Window**. Lets you use PGP Desktop functionality (Decrypt & Verify, Encrypt & Sign, Sign, Encrypt) on the contents of the current window.
- **Clipboard**. Lets you use PGP Desktop functionality (Decrypt & Verify, Encrypt & Sign, Sign, Encrypt) on the contents of the Clipboard. Also lets you clear or edit the contents of the Clipboard.

Using Shortcut Menus in Windows Explorer

You can also access PGP Desktop functions using shortcut menus in Windows Explorer. Open Windows Explorer, right-click the items you want to work on, and select **PGP Desktop** from the shortcut menu.

Windows Explorer gives you access to PGP Desktop functions depending on the item that you right-clicked:

- **Drive**. If you right-click a drive on your system in Windows Explorer and select PGP Desktop from the menu displayed, you can do the following to the drive:
  - PGP Shred Free Space on it
- **PGP Virtual Disk**. If you right-click a mounted PGP Virtual Disk drive on your system in Windows Explorer and select PGP Desktop from the menu displayed, you can do the following to the drive:
  - Unmount the PGP Virtual Disk
  - Locate the PGP Virtual Disk file (.pgd) in Windows Explorer
  - Edit the PGP Virtual Disk properties

  If you right-click the PGP Virtual Disk file (.pgd) in Windows Explorer for an unmounted disk, and select PGP Desktop from the menu displayed, you can also do the following:
  - Compact unused space
  - Use PGP Shred to securely delete the PGP Virtual Disk (note that this also deletes all data on the disk)
  - Re-encrypt the PGP Virtual Disk
- **Folder**. If you right-click a folder in Windows Explorer and select PGP Desktop from the menu displayed, you can do the following to the folder:
  - Add to new PGP Zip
  - Create Self-Decrypting Archive of the contents in the folder
  - Secure with a key or passphrase
  - Decrypt & Verify it
  - Add it to PGP NetShare
  - Shred it

- **File**. If you right-click a file in Windows Explorer and select PGP Desktop from the menu displayed, you can do the following to the file, depending on what kind of file it is:
  - If you select an unencrypted file, you can Secure it with a key or passphrase, Sign, Shred, or Create a Self-Decrypting Archive
  - If you select an encrypted file, you can decrypt/verify or Shred it
  - If you select an unmounted PGP Virtual Disk volume (`.pgd`), you can mount or edit it; if you select a mounted volume, you can unmount it
  - If you select a PGP Zip (.PGP) file, you can Decrypt & Verify it, View it, or Shred it
  - If you select a PGP key file (`.asc`), you can decrypt/verify or Shred it. If you select decrypt/verify, you are given the option of importing the file
  - If you select a PGP public or private keyring file (PKR or SKR files, respectively), you can add the keys in it to your keyring or Shred it

Using the Start Menu

You can access PGP Desktop through the Windows Start menu. To do this, select **Start > Programs > PGP**.

The Start menu provides you with access to:

- PGP Desktop documentation in English and other supported languages
- The PGP Desktop application
- Uninstalling PGP Desktop

PGP Desktop Notifier alerts

The PGP Desktop Notifier feature displays a small information box that tells you the status of incoming and outgoing email messages, as well as instant messaging sessions.

Note: The PGP Desktop Notifier feature also displays the status of the PGP Whole Disk Encryption and PGP NetShare features on your computer. For more information, see *PGP Desktop Notifier for Disk features* (on page 37).

PGP Desktop Notifier for Messaging

Use the PGP Desktop Notifier for Messaging feature to:

- See if an incoming email is properly decrypted and/or signed.
- See if an outgoing email is properly encrypted and/or signed.
- Stop an email message from being sent if the encryption options are not what you want.
- View a quick summary of the sender, subject, and encryption key of an email.
- Review, at any time, the status of previous incoming or outgoing messages for that Windows session.
- See that a chat session with another PGP Desktop user is being secured.

Use the PGP Desktop Notifier feature to monitor all or some of your incoming email, as well as maintain precise control over all or some of your outgoing messages. The choice is yours. You can set various Notifier options, or turn the PGP Desktop Notifier feature completely off if you prefer.

Some additional points about the PGP Desktop Notifier feature:

- For message notifications, use the left and right arrow buttons in the upper-right corner of the Notifier box to scroll Notifier messages forward or backward. This way, you can review messages that came before or after the message you are viewing currently.
- When they first display, Notifier message boxes have a partially transparent appearance to prevent obscuring anything on your screen. Notifier message boxes become opaque if you move your cursor over them, and become translucent again when you move your cursor away from them.
- Unless the cursor is over them, Notifier messages display for four seconds (this default setting can be changed in the Notifier options). If you want more time to read a Notifier, move your cursor over the Notifier and it remains on your display.
- If you completely miss reading a Notifier, or you would like to review previous ones, do the following:
  - On Windows systems, choose **View Notifier** from the PGP Tray icon.
  - On Mac OS X systems, choose **View Notifier** from the PGP Desktop icon in the Mac OS X Menu Bar.
- Close a Notifier message by clicking the **X** (in the upper right corner of the message on Windows systems, in the upper left corner on Mac OS X systems).

For more information about setting PGP Desktop Notifier options, see *Notifier Options* (on page 297).

Incoming PGP Desktop Notifier Messages

Notifications for incoming email provide information on whether the email was decrypted and verified, or decrypted and signed by an unverified or unknown key.

Outgoing PGP Desktop Notifier Messages

For simple notification, choose to have a PGP Desktop Notifier appear momentarily when email is sent (all email, or email meeting certain criteria).

You can also set PGP Desktop to include **Block** and **Send** buttons in the Notifier box.

To manage the outgoing email with this Notifier

1. In the PGP Outgoing Message Notifier box, do the following:
   - To stop this email message from being sent, click **Block**. Note this blocks only this outgoing email message; future email messages to this sender can be sent.
   - To send this message, even though the recipient's key cannot be found, click **Send**.
   - To continue to delay a message from being processed, hover your cursor over the Notifier box. When you move your cursor away from the Notifier box, the message is then processed using the default rule.
   - In Notifier options, the **Delay outbound mail for** setting specifies how long (in seconds) the Notifier gives you before it sends the mail without your intervention. The Notifier displays a countdown before it sends your mail.
2. To view additional information, including the Action, Recipient, Policy, and Signing Key, click **More**.

   It is not necessary for you to view this additional information unless you want to see it. To hide it again, click **Less**.

Outgoing PGP Desktop Notifier Messages for Offline Policy

If you are using PGP Desktop in a PGP Universal Server-managed environment, your administrator may have specified what actions to take on outgoing messages if the PGP Universal Server is not available. The outgoing notifier message indicates one of the following:

- Your PGP Universal Server is not available and policy has been set to block all messages. Email messages remain in your outbox and are sent when the PGP Universal Server can be contacted.
- Your PGP Universal Server is not available and policy has been set to send all messages in the clear.
- Your PGP Universal Server is not available and policy has been set to allow your local policy to take precedence.

In the latter two cases, you can choose to send or block the outgoing message as you would any other outgoing message.

PGP Notifier for Instant Messaging

If you have PGP Desktop installed on your computer, and if you have specified to receive Notifiers for Instant Messaging (under the **Notifications** tab in PGP Desktop Preferences), then PGP Desktop Notifiers alert you when the AOL Instant Messenger (AIM) sessions that you have with other PGP Desktop users are protected.

When you use the secure instant messaging feature, a Notifier displays when you log on to the instant messaging program to inform you that your chat is secure, and a padlock icon displays next to your "buddy name" with most AIM-compliant instant messaging clients.

When you log off of your instant messaging program, a final Notifier message informs you that the secure session has ended.

For more information on proper configuration, as well as the use of the secure instant message chat feature, see Securing Instant Messages.

PGP Desktop Notifier for Disk features

The PGP Desktop Notifier for Disk features keep you informed when you are working with the PGP NetShare and the PGP Whole Disk Encryption features.

Note: The PGP Desktop Notifier feature also displays the status of incoming and outgoing email messages on your computer. For more information, see *PGP Desktop Notifier for Messaging* (on page 34).

PGP NetShare

When used with PGP NetShare, the PGP Desktop Notifier feature alerts you to these things:

- Actions taken to a shared folder.
- Location of the affected folder.
- Name of the affected folder.
- Who performed the action.

PGP Whole Disk Encryption

When used with the PGP Whole Disk Encryption feature, the PGP Desktop Notifier feature alerts you to these things:

- The disk being encrypted.
- The size and type of disk.

- Status of the encryption process.

Enabling or Disabling Notifiers

To enable or disable Notifiers

1. Open PGP Desktop and select **Tools > PGP Options**.
2. Click the Notifier tab.
3. Under **Usage**, specify if you want to **Use PGP Notifer** and, if so, the location. PGP Desktop Notifications can appear at any of the four corners of your screen **(Lower Right**, **Lower Left**, **Upper Right**, or **Upper Left**). Select the corner that you want PGP Desktop Notifications to appear. The default position is **Lower Right**.
4. If you are using PGP Desktop Messaging and you want PGP Desktop Notifiers to appear, informing you of encryption and/or signing status when you send email, select the checkbox to **Notify when processing outbound email**. Deselect this checkbox to stop PGP Desktop Notifiers from appearing when you send mail.
5. PGP Desktop looks for a public key for every recipient of the email messages that you send. By default, if it cannot find a public key for a recipient, it sends that email in the clear (without encryption). Select **Ask me before sending email when the recipient's key is not found** if you want to be notified when a key is not found and be given a chance to block the email so that it is not sent. Then specify the following options:
   - **Always ask me before sending email:** Select this checkbox if you would prefer approving every email that you send. You can review the encryption status in the Notifier, and either send or block the email.
   - **Delay outbound email for n second(s) to confirm** (where *n* is a number from 1-30; the default is 4 seconds). To change the amount of time that outbound messages are delayed, and a PGP Desktop Notifier is displayed, click the up or down arrows. Use the delay period to review the PGP Desktop Notifier message.

   (For more information on the PGP Desktop default policy settings, see *Services and Policies* (on page 91).)
6. For incoming email, specify how you are notified of its status upon arrival. Select one of the following for **Display notifications for incoming mail:**
   - **When receiving secured email**—A Notifier appears whenever you receive secured email. The box displays who the email is from, its subject, its encryption and verification status, and the email address of the person sending it.
   - **Only when message verification fails**—For incoming email, you see a Notifier only when PGP Desktop is unable to verify the signature of the incoming email.

- **Never**—If you do not need or want to see a Notifier as you receive email, select this option. This option does not affect Notifiers for outgoing mail.

7 If you want a PGP Desktop Notifier to appear briefly when you begin a secure instant message chat, and appear briefly again when the chat ends, select the checkbox to **Notify for status of PGP Encrypted IM sessions**.

Viewing the PGP Log

Use the PGP Log to see what actions PGP Desktop is taking to secure your data.

To view the PGP Log

1 To view logs, you must turn on logging. To do this, in PGP Desktop select **Tools > Enable Logging**.

2 Do one of the following:

- Click the PGP Desktop system tray icon and select **View PGP Log** from the shortcut menu. The PGP Log opens in a new window.
- In PGP Desktop, select **Tools > View Log**. The PGP Log opens in a new window.
- In PGP Desktop, click the PGP Messaging control box and then click **PGP Log**. The PGP Log is displayed in the application window.

3 To change the view options or filter on specific logging information, do the following:

- Click the arrow for **View log for** to select the days of the logs you want to view.
- Click the arrow for **View topic** to select the types of logs you want to view. Choose from **All**, **PGP**, **Email**, **IM, Whole Disk**, **NetShare**, **Zip/SDA**, or **Virtual Disk**.
- Click the arrow for **View level** to select the minimum severity of log entries you want to view. Choose from **Error**, **Warn, Info**, or **Verbose**.

  To view **Verbose** logs, the PGP Log view window must remain open. When you close the window, the level of logging reverts back to the default level, **Info**. Note that **Verbose** can result in some large log files.

4 When you are finished viewing the log:

- To save a copy of the PGP Log, click **Save**.
- To clear the entries in the PGP Log, click **Shred**.
- To exit the PGP Log window, click **Close**.

5 Working with PGP Keys

PGP Keys is the feature of PGP Desktop you use to create and maintain your keypair(s) and the public keys of other PGP Desktop users.

This section describes viewing keys, creating a keypair, distributing your public key, getting the public keys of others, and working with keyservers.

Note: If you are using PGP Desktop in a PGP Universal Server-managed environment, your PGP Universal Server administrator may have disabled certain features. When a feature is disabled, the control item in the left side is not displayed and the menu and other options for that feature are not available. The graphics included in this guide depict the default installation with all features enabled. If your PGP Universal Server administrator has disabled this functionality, this section does not apply to you.

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Creating a Keypair 42
Protecting Your Private Key 45
Distributing Your Public Key 47
Getting the Public Keys of Others 50
Working with Keyservers 52
Using Master Keys 53

Viewing Keys

To view the keys on the local keyring, open PGP Desktop and click on the PGP Keys Control box. Then click:

- **All Keys**. Shows all PGP keys on your keyrings.
- **My Private Keys**. Shows only the private keys on your keyrings.
- **Search for Keys**. Lets you search for keys on your keyrings based on criteria you specify.
- **Smart Card Keys**. If you have a smart card on your system, you also have this option.

Some of the more common tasks you may want to perform are available from the PGP Keys Control box or work area. These are:

- If a public key is selected in any view of the PGP Keys on your keyrings, the option to **Email this Recipient** is available in the PGP Keys Control box.
- If you perform a search, and you select a public key found in the search that is not on your local keyrings, the option **Add to my Keyring** is available in the PGP Keys Control box.
- To see the properties of any key displayed in the work area, just double-click any part of the key listing to display the Key Properties dialog box for that key.

When you perform a search, the option **Save this Key Search** is available in the PGP Keys Control box, so you can save the results for later access.

Creating a Keypair

You probably already created a PGP keypair for yourself using the PGP Desktop Setup Assistant or with a previous version of PGP Desktop — but if you have not, you need to now. Most of the things you do with PGP Desktop require a keypair.

Caution: It is bad practice to keep creating new keys for yourself. A PGP keypair is like a digital driver's license or passport; if you create lots of them, you're going to end up confusing yourself and those people who want to send you encrypted messages. It is best to have only one key that contains all the email addresses that you use. The PGP Global Directory will publish only one key per email address.

If you are using PGP Desktop in a PGP Universal Server-managed environment, keypair creation may be disabled.

To create a PGP keypair

1. Make sure the PGP Keys Control box is selected.
2. Select **File > New PGP Key** or press Ctrl+N. The first screen of the PGP Key Generation Assistant is displayed.
3. Read the information on this screen.
4. If you want to generate your new PGP keypair on a token or smart card, make sure the token or smart card is connected to the system and then select the box labeled **Generate Key on Token: [name of smart card or token on system]**. For more information about smart cards and tokens, see *Storing Keys on Smart Cards and Tokens* (on page 269).
5. Click **Next**. The Name and Email Assignment screen is displayed.

6 Type your real name in the **Full Name** field and your correct email address in the **Primary Email** field. It is not absolutely necessary to type your real name or even your email address. However, using your real name makes it easier for others to identify you as the owner of your public key. Also, when you upload your public key to the PGP Global Directory (which makes it easily available to other PGP Desktop users), your real email address is required.

7 If you would like to add more email addresses to the key you are creating, click **More** and type them in the fields that appear.

8 To specify advanced settings for the key you are creating, click **Advanced**. The Advanced Key Settings dialog box is displayed. Use this dialog box to specify the key type and size, expiration, and other settings.

9 Select settings for the following:

- **Key type**. Choose between Diffie-Hellman/DSS and RSA.
- **Generate separate signing subkey**. Select this box if you need a separate subkey for signing. A separate Signing Subkey is created along with the new keypair. You can also create additional signing or encryption subkeys any time after the new key has been created. For more information about separate Signing and Encryption Subkeys, see *Working with Subkeys* (on page 67).
- **Key size**. Type from 1024 bits to 4096 bits. The larger the key, the more secure it is, but the longer it will take to generate. Some smart cards and tokens limit key size to 1024 bits.
- **Expiration**. Select **Never** or specify a date on which the keypair you are creating will expire.
- **Allowed Ciphers**. Deselect any cipher you do not want the keypair you are creating to support.
- **Preferred Cipher**. Select the cipher you want to be used in those cases where no algorithm is specified. Only a cipher that is allowed can be selected as preferred.
- **Allowed Hashes**. Deselect any hash you do not want the keypair you are creating to support.
- **Preferred Hash**. Select the hash you want to be used in those cases where no hash is specified. Only a hash that is allowed can be selected as preferred.

10 Click **OK** to close the Advanced Key Settings dialog box.

11 Click **Next**.

12 If you are part of a PGP-Universal managed environment, you may see the Organization Settings screen, which displays keys your PGP administrator has configured to add to your copy of PGP Desktop (such as your organization's Additional Decryption Key (ADK) or Organization Key).

The Passphrase Assignment screen is displayed.

13 Type the passphrase you want to use to maintain exclusive access to the private key of the keypair being created.

14 To confirm your entry, press **Tab** to advance to the Confirmation field, then type the same passphrase again. For information on the Passphrase Quality Bar, see *The Passphrase Quality Bar* (on page 304).

Note: Normally, as an added level of security, the characters you type for the passphrase do not appear on the screen. However, if you are sure that no one is watching, and you want to see the characters of your passphrase as you type, select the **Show Keystrokes** checkbox.

Warning: Unless your PGP administrator has implemented a PGP key reconstruction policy for your company, no one, including PGP Corporation, can salvage a key with a forgotten passphrase.

15 Click **Next** to begin the key generation process. PGP Desktop generates your new keypair.

This process can take several minutes.

16 When the key generation process indicates that it is done, click **Next**. You are prompted to add the public key portion of the key you just created to the PGP Global Directory.

17 Read the text on the screen and click **Next** to add your new key to the PGP Global Directory (recommended). Click **Skip** if you want to prevent the public key from being posted to the PGP Global Directory.

18 Click **Finish**. Your new PGP keypair has been generated. It should be visible in the PGP Keys Work area. If you don't see it listed, make sure **All Keys** or **My Private Keys** is selected in the PGP Keys Control box.

Caution: Consider backing up your private key to a safe location at this point. Your private key is very important, and losing it could have catastrophic consequences once you have data that is encrypted to it. See *Protecting Your Private Key* (on page 45).

Passwords and Passphrases

Encrypting a file and then finding yourself unable to decrypt it is a painful lesson in learning how to choose a passphrase you will remember.

Most applications require a password between three and eight letters. Using a single-word passphrase is generally a bad practice, and is discouraged. A single word password is vulnerable to a dictionary attack, which consists of having a computer try all the words in the dictionary until it finds your password. You can imagine simple enhancements to dictionary attacks which manage to find broad arrays of passwords even when slightly modified from dictionary terms.

To protect against this manner of attack, it is widely recommended that you create a word that includes a combination of upper and lowercase alphabetic letters, numbers, punctuation marks, and spaces. This results in a stronger password, but an obscure one that you are unlikely to remember easily.

Trying to thwart a dictionary attack by arbitrarily inserting a lot of non-alphabetic characters into a passphrase makes your passphrase too easy to forget and could lead to a disastrous loss of information because you can't decrypt your own files. A multiple word passphrase is less vulnerable to a dictionary attack. However, unless the passphrase you choose is something that is easily committed to long-term memory, you are unlikely to remember it verbatim.

Picking a phrase on the spur of the moment is likely to result in forgetting it entirely. Choose something that is already residing in your long-term memory. It should not be something that you have repeated to others recently, nor a famous quotation, because you want it to be hard for a sophisticated attacker to guess. If it's already deeply embedded in your long-term memory, you probably won't forget it. Of course, if you are reckless enough to write your passphrase down and tape it to your monitor or put it in your desk drawer, it won't matter what you choose.

For more information, see *Working with Passwords and Passphrases* (on page 303).

Protecting Your Private Key

PGP Corporation recommends that you take these actions immediately after you create your keypair:

Caution: Failure to take these actions could result in a devastating loss of data some time in the future.

- Back up a copy of your private key file to another, safe location, in case your primary copy is ever damaged or lost. See *Backing up Your Private Key* (on page 46).
- Reflect on your chosen passphrase to ensure that you chose something that you will not forget. If you are concerned that you chose a passphrase during the key creation process that you will not remember, change it RIGHT NOW to something you will not forget. For information on changing your passphrase, see *Changing Your Passphrase* (on page 61).

Your private key file is very important because once you have encrypted data to your public key; only the corresponding private key can be used to decrypt the data. This holds true for your passphrase as well; losing your private key or the passphrase means that you will not be able to decrypt data encrypted to the corresponding public key. When you encrypt information, it is encrypted to both your passphrase and your private key. You need both to decrypt the encrypted data. Once the data is encrypted, no one—not even PGP Corporation—can decrypt the data without your private key file and your passphrase.

Consider a situation where you have important encrypted data, and then either forget your passphrase or lose your private key. The encrypted data would be inaccessible, unusable, and unrecoverable.

Protecting Keys and Keyrings

Besides making backup copies of your keys, you should be especially careful about where you store your private key. Even though your private key is protected by a passphrase that only you should know, it is possible that someone could discover your passphrase and then use your private key to decipher your email or forge your digital signature. For instance, somebody could look over your shoulder and watch the keystrokes you enter or intercept them on the network or even over the Internet.

To prevent anyone who might happen to intercept your passphrase from using your private key, store your private key only on your own computer. If your computer is attached to a network, make sure that your files are not automatically included in a system-wide backup where others might gain access to your private key. Given the ease with which computers are accessible over networks, if you are working with extremely sensitive information, you may want to keep your private key on a diskette, which you can insert like an old-fashioned key whenever you want to read or sign private information.

As another security precaution, consider assigning a different name to your private keyring file and then storing it somewhere other than in the default location. Use the Keys tab of the Options dialog box to specify a name and location for your private and public keyring files.

Your private and public keys are stored in separate keyring files. You can copy them to another location on your hard drive or to a diskette. By default, the private keyring (`secring.skr`) and the public keyring (`pubring.pkr`) are stored along with the other program files in your "PGP" folder; you can save your backups in any location you like.

Keys generated on a smart card cannot be backed up because the private portion of your keypair is non-exportable. (Keys can be generated on a smart card on Windows systems only.)

You can configure PGP Desktop to back up your keyrings automatically after you close PGP Desktop. Your keyring backup options can be set in the Keys tab of the Options dialog box (for Windows) and in the Keys section of the Preferences dialog box (for Mac OS X).

Backing up Your Private Key

▸ **To back up your private key**

1. In the PGP Keys control box, click **My Private Keys**.
2. Select the icon representing your keypair.

3 Select **File > Export**.

4 Type a name for the file.

5 Select the **Include Private Key(s)** check box. This is important, because if you do not do this, only your public key will be exported.

6 Click **Save**.

7 Copy the file (which has an .asc extension) to a secure location. This may be a compact disc which you carefully archive, another personal computer, or a USB flash drive that you keep in a safe location. Please remember not to distribute this file to others, as it contains both your private key and your public key.

Note: If you are in a PGP Universal Server-managed environment and your key mode is SKM, you cannot export your key using this method. To export your keypair, ask your PGP Universal Server administrator to export it from the management console. To determine what your key mode is, see *Key Modes* (on page 120).

What if You Lose Your Key?

If you lose your key and do not have a backed up copy from which to restore your key, you will never again be able to decrypt any information encrypted to your key. You can, however, reconstruct your key if your PGP administrator has implemented a key restoration policy for your company. For more information, see *PGP Key Reconstruction* (see "Reconstructing Keys with PGP Universal Server" on page 79, "If You Lost Your Key or Passphrase" on page 78) and contact your PGP administrator.

Distributing Your Public Key

After you create your PGP Desktop keypair, you need to get your public key to those with whom you intend to exchange encrypted messages.

You make your public key available to others so they can send you encrypted information and verify your digital signature; and you need their public key to send encrypted messages to them.

You can distribute your public key in various ways:

- *Publish your key on the PGP Global Directory* (see "Placing Your Public Key on a Keyserver" on page 48).

  Generally none of the other methods are necessary once your key is published to this directory.

- *Include your public key in an email message* (see "Including Your Public Key in an Email Message" on page 49).

- *Export your public key or copy it to a text file* (see "Exporting Your Public Key to a File" on page 49).

On Windows systems, you can also:

- *Copy from a Smart Card directly to someone's keyring* (see "Copying from a Smart Card Directly to Someone's Keyring" on page 50).

Placing Your Public Key on a Keyserver

The best method for making your public key available is to place it on a public keyserver, which is a large database of keys, where anyone can access it. That way, people can send you encrypted email without having to explicitly request a copy of your key. It also relieves you and others from having to maintain a large number of public keys that you rarely use.

There are a number of keyservers worldwide, including the PGP Global Directory, where you can make your key available for anyone to access. If you are using PGP Desktop in a domain protected by a PGP Universal Server, your PGP administrator will have preconfigured PGP Desktop with appropriate settings.

When you're working with a public keyserver, keep these things in mind before you send your key:

- Is this the key you intend to use? Others attempting to communicate with you might encrypt important information to that key. For this reason, we strongly recommend you only put keys on a keyserver that you intend for others to use.
- Will you remember your passphrase for this key so you can retrieve data encrypted to it or, if you don't want to use the key, so you can revoke it?
- Other than the PGP Global Directory, once a key is up there, it's up there. Some public keyservers have a policy against deleting keys. Others have replication features that replicate keys between keyservers, so even if you are able to delete your key on one server, it could reappear later.

Most people post their public key to the PGP Global Directory right after they create their keypair. If you have already posted your key to the PGP Global Directory, you do not need to do it again. Under most circumstances, there is no need to publish your key to any other keyserver. Note also that other keyservers may not verify keys, and thus keys found on other keyservers may require significantly more work on your part to contact the key owner for fingerprint verification.

To manually send your public key to a keyserver

1. Open PGP Desktop.
2. Make sure the PGP Keys Control box is selected.
3. Right-click the keypair whose public key you want to send to the keyserver.

4 Select **Send To** and then select the keyserver you want to send the public key to from the list. If the keyserver you want to send your public key to is not on the list, see *Working with Keyservers* (on page 52). PGP Desktop lets you know when the public key is successfully copied to the keyserver.

Once you place a copy of your public key on a keyserver, it's available to people who want to send you encrypted data or to verify your digital signature. Even if you don't explicitly point people to your public key, they can get a copy by searching the keyserver for your name or email address.

Many people include the Web address for their public key at the end of their email messages. In most cases, the recipient can just double-click the address to access a copy of your key on the server. Some people even put their PGP fingerprint on their business cards for easier verification.

Including Your Public Key in an Email Message

Another convenient method of delivering your public key to someone is to include it with an email message.

When you send someone your public key, be sure to sign the email. That way, the recipient can verify your signature and be sure no one has tampered with the information along the way. Of course, if your key has not yet been signed by any trusted introducers, recipients of your signature can only truly be sure the signature is from you by verifying the fingerprint on your key.

To include your public key in an email message

1 In PGP Desktop, make sure the PGP Keys Control box is selected.

2 Right-click the keypair whose public key you want to include in an email message.

3 Select **Send To** and then select **Mail Recipient**. Your email application opens with your key information already in place.

4 Address the message and send it.

If this method does not work for you, you can open PGP Desktop, select your keypair, select **Edit > Copy**, open an email message, then paste the public key into the body of the message. With some email applications you can simply drag your key from PGP Desktop into the text of your email message to transfer the public key information.

Exporting Your Public Key to a File

Another method of distributing your public key is to export it to a file and then make this file available to the person with whom you want to communicate securely.

There are three ways to export or save your public key to a file:

- Select your keypair, then select **File > Export**. Enter a name and a location for the file, then click **Save**. Be sure *not* to include your private key along with your public key if you plan on giving this file to others.
- Ctrl+click the key you want to save to a file, select **Export** from the list, enter a name and a location for the file, then click **Save**. Be sure *not* to include your private key along with your public key if you plan on giving this file to others.
- Select your keypair, then select **Edit > Copy**. Open a text editor and select **Paste** to insert the key information into the text file, and save the file. You can then email or give the file to anyone you like. The recipient needs to use PGP Desktop on his or her system to retrieve the public key portion.

Copying from a Smart Card Directly to Someone's Keyring

Another method of distributing your public key—if you have it on a smart card—is to copy it from the smart card directly to someone's keyring.

For more information about how to do this, see *Copying your Public Key from a Smart Card to a Keyring* (on page 275).

Getting the Public Keys of Others

Just as you need to distribute your public key to those who want to send you encrypted mail or verify your digital signature, you need to obtain the public keys of others to send them encrypted mail or verify their digital signatures.

There are multiple ways to obtain someone's public key:

- Automatically retrieve the verified key from the PGP Global Directory
- Find the key manually on a public keyserver
- Automatically add the public key to your keyring directly from an email message
- Import the public key from an exported file
- Get the key from your organization's PGP Universal Server

Public keys are just blocks of text, so they are easy to add to your keyring by importing them from a file or by copying them from an email message and then pasting them into your public keyring in PGP Desktop.

Getting Public Keys from a Keyserver

If the person to whom you want to send encrypted mail is an experienced PGP Desktop user, it is likely that a copy of his or her public key is on the PGP Global Directory or another public keyserver. This makes it very convenient for you to get a copy of the most up-to-date key whenever you want to send him or her mail and also relieves you from having to store a lot of keys on your public keyring.

There are a number of public keyservers, such as the PGP Global Directory maintained by PGP Corporation, where you can locate the keys of most PGP users. If the recipient has not pointed you to the Web address where his or her public key is stored, you can access any keyserver and do a search for the user's name or email address. This may or may not work, as not all public keyservers are regularly updated to include the keys stored on all the other servers.

If you are in a domain protected by a PGP Universal Server, then your PGP administrator may direct you to use the keyserver built into the PGP Universal Server. In this case, your PGP Desktop software is probably already configured to access the appropriate PGP Universal Server.

Similarly, the PGP Universal Server is configured by default to communicate with the PGP Global Directory. Thus, the PGP ecosystem distributes the load of key lookup and verification.

To get someone's public key from a keyserver

1. Open PGP Desktop and highlight the PGP Keys Control box.
2. Choose **Search for Keys** from the PGP Keys Control box. The Search for Keys screen is displayed in the Work area.
3. Specify your search criteria, then click **Search**. If you want to search only a specific keyserver, click in the **Search** field and select the keyserver. If the keyserver you want to search is not currently on the list, select **Edit Keyserver List** and add it.

   You can search for keys on a keyserver by specifying values for multiple key characteristics. The inverse of most operations is also available. For example, you may search using "User ID is not Charles" as your criteria.

   The results of the search appear.
4. If the search found a public key you want to add to your keyring, click **Add to My Keying** in the PGP Keys Control box. The selected key is added to your keyring.

Tip: If you set the search criteria to look for a very common name (for example, 'Name', 'contains', "John"), only the first match found is returned. This is by design, to prevent phishing (or harvesting keys from a keyserver). For common names or domains, you may have to enter the entire name or email address in order to find the correct key.

Getting Public Keys from Email Messages

A convenient way to get a copy of someone's public key is to have that person attach it to an email message.

To add a public key attached to an email message

1. Open the email message.
2. Double-click the `.asc` file that includes the public key. PGP Desktop recognizes the file format and opens the Select key(s) dialog box.
3. If asked, specify to open the file.
4. Select the public key(s) you want to add to your keyring and click **Import**.

Working with Keyservers

PGP Desktop understands the following kinds of keyservers:

- **PGP Universal keyservers**. If you are using PGP Desktop in a domain protected by a PGP Universal Server, PGP Desktop is preconfigured to only communicate with the keyserver built into the PGP Universal Server with which it has a relationship. To PGP Desktop, this is a trusted keyserver, and PGP Desktop will automatically trust any key it finds on this keyserver unless the PGP Universal Server tells PGP Desktop that the key is not trusted—this can happen, for instance, when verifying signatures from remote keys.

  The address for your PGP Universal keyserver may look like https://keyserver.example.com.

- **The PGP Global Directory**. If you are using PGP Desktop outside of a domain protected by a PGP Universal Server, PGP Desktop is preconfigured to communicate with the *PGP Global Directory* (https://keyserver.pgp.com).

  The PGP Global Directory is a free, public keyserver hosted by PGP Corporation and provides quick and easy access to the universe of PGP keys. It uses next-generation keyserver technology that verifies the key associated with each email address (so the keyserver does not fill up with unused keys, multiple keys per email address, forged keys, and other problems that plagued older keyservers) and lets you manage your own keys, including replacing your key, deleting your key, and adding email addresses to your key. Using the PGP Global Directory significantly enhances your chances of finding the public key of someone with whom you want to send secured messages.

To PGP Desktop, the PGP Global Directory is a trusted keyserver, and PGP Desktop automatically trusts any key it finds there. During the initial connection to the PGP Global Directory, the PGP Global Directory Verification Key is downloaded, signed, and trusted by the key you publish to the directory. The PGP Global Directory key is also added to your keyring. All of the keys verified by the PGP Global Directory are thus considered valid by PGP Desktop.

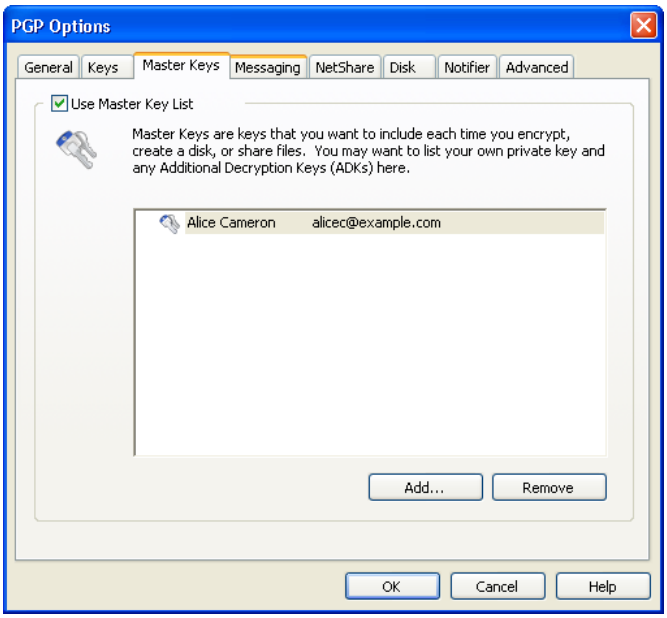
PGP Universal Services Protocol. The PGP Universal Services Protocol (USP) is a SOAP protocol operating over standard HTTP/HTTPS ports. This is the default key lookup mechanism. If you are in a PGP Universal Server-managed environment, all key search requests as well as all other communications between the the PGP Universal Server and PGP Desktop use PGP USP.

- **Other keyservers**. In most cases, other keyservers are other public keyservers. However, you may have access, through your company or some other means, to a private keyserver.

For more information about working with keyservers, see *Keys Options* (on page 284).

Using Master Keys

The Master Key List is a set of keys that you want added by default any time you are selecting keys for messaging, disk encryption, PGP NetShare, and PGP Zip. This saves you the step of dragging the keys that you regularly use into the **Recipients** field.



Note: If you generated your key using the Setup Assistant, your key is automatically added to the Master Key list. If you skipped key generation and imported your key into PGP Desktop, your key is not automatically added to the list.

Adding Keys to the Master Key List

To add keys to the Master Key List

1. In PGP Desktop, select **Tools > Options**.
2. Select the Master Keys tab.
3. To use the Master Key List, select the **Use Master Key List** checkbox. You cannot add or remove keys from the Master Key List unless this box is selected.
4. Click **Add.** The Select Master Keys dialog box is displayed.
5. From the **Key Source** list on the left, select the key(s) that you want to use. Use Shift+click or Ctrl+click to select multiple keys.
6. After selecting the keys you want, click **Add.**

   Tip: If there are any keys in the **Keys to Add** list on the right that you do not want to include, select them and click **Remove.**
7. When you have finished selecting keys, click **OK.** The keys you have selected appear in the Master Key List.

Deleting Keys from the Master Key List

To remove keys from the Master Key List

1. In PGP Desktop, select **Tools > Options**.
2. Select the Master Keys tab.
3. To use the Master Key List, select the **Use Master Key List** checkbox. You cannot add or remove keys from the Master Key List unless this box is selected.
4. Select the key(s) that you want to remove. You can Shift+click or Ctrl+click to select multiple keys.
5. Click **Remove.** The key(s) are removed.

6 Managing PGP Keys

This section describes how to manage keys with the PGP Desktop application.

Note: If you are using PGP Desktop in a PGP Universal Server-managed environment, your PGP Universal Server administrator may have disabled certain features. When a feature is disabled, the control item in the left side is not displayed and the menu and other options for that feature are not available. The graphics included in this guide depict the default installation with all features enabled. If your PGP Universal Server administrator has disabled this functionality, this section does not apply to you.

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Examining and Setting Key Properties

The PGP Keys Work Area can display these important details about your keys:

- Name
- Email address

- Validity
- Size
- KeyID
- Trust
- Creation date
- Expiration date
- ADK
- Status
- Key description
- Key usage

You can choose how many or how few details are displayed by clicking the **Keys** item, then choosing columns to display by selecting **View > Columns**.

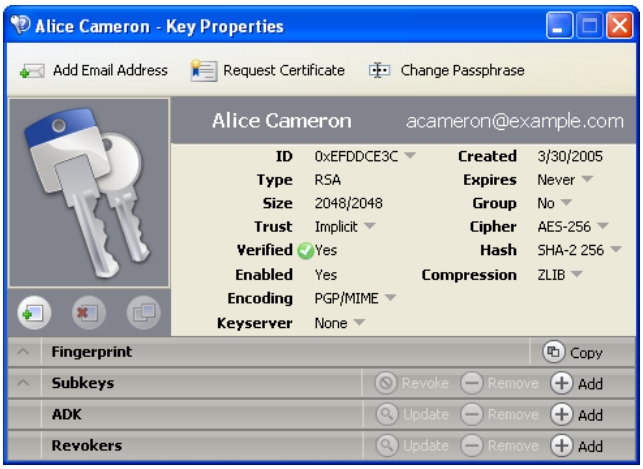
You can, however, see more information about a key and you can modify certain information about a key, by examining its key properties.

Note: If you are in a PGP Universal Server-managed environment and your key mode is SKM, you cannot make changes to your key. In addition, SKM keys are set to never expire. To determine what your key mode is, see *Key Modes* (on page 120).

To view a key's properties

1 Open PGP Desktop, click the PGP Keys Control box, and then click **All Keys** in the Control box. All keys on your keyring appear.

2 Double-click the key whose properties you want to view. The Key Properties dialog box for the key you selected is displayed.



Working With Photographic IDs

You can include a photographic ID on your Diffie-Hellman/DSS and RSA keys.

To add your photograph to your key

1. Open PGP Desktop, click the PGP Keys Control box, and select **My Private Keys**.
2. In the PGP Keys Work area, double-click the private key to which you are adding the photo ID. The Key Properties dialog box for the selected key is displayed.
3. Right-click the placeholder key and silhouette icon and select **Add Photo ID**. The Add Photo dialog box is displayed.
4. Drag or paste your photograph onto the Add Photo dialog box or browse to it by clicking **Select File**.
5. Click **OK**. The Passphrase dialog box opens.
6. Type your passphrase for the key you are modifying, then click **OK**. Your photo ID is added to your public key.

To delete a photo ID

- Right-click the existing photo on the Key Properties dialog box and select **Remove Photo ID**. The photo is removed from the key.

To copy a photo ID

- Right-click the existing photo on the Key Properties dialog box and select **Copy Photo ID**. You can then paste the photo into another key or into a graphics program.

Managing User Names and Email Addresses on a Key

PGP Desktop supports multiple user names and email addresses on your keypair. These names and email addresses help others find your key so that they can send you encrypted messages.

To add a new user name or address to your key

1. Open PGP Desktop, click the PGP Keys Control box, and select **My Private Keys**.

2 In the PGP Keys Work area, double-click the private key to which you are adding a user name or email address. The Key Properties dialog box for the key you double-clicked is displayed.

3 Click **Add Email Address**. The PGP New User Name dialog box is displayed.

4 Type the new name and email address in the appropriate fields, then click **OK**. The PGP Enter Passphrase for Key dialog box is displayed.

5 Enter the private key passphrase of the key you are modifying, then click **OK**.

6 To set the new user name and address as the primary identifier for your key, click the name of the current primary keyholder in the Key Properties dialog box and select the user you just added.

7 Exit the Key Properties dialog box. In the list of keys in PGP Desktop, the new name is added to the end of the user name list associated with the key.

To change the primary name associated with your key

1 Do one of the following:

- In the Key Properties dialog box, click the name of the current primary keyholder and select the name of the user from the list that is displayed.
- In PGP Desktop, expand your key in the keys list, right-click the user name you want to set as the primary identifier, and choose **Set as Primary Name** from the shortcut menu.

To delete a name/email address from your keypair

1 From the list of keys, click the plus sign to the left of the key name to expand the key.

2 Select the user ID you want to delete.

3 Press the Delete key on your keyboard. A confirmation dialog box is displayed.

Tip: You can also select **Edit > Delete** (on Windows systems) or **Edit > Clear** (on Mac OS X systems).

4 Click **Delete**. The user ID is deleted.

Importing Keys and X.509 Certificates

You can import PGP public keys and PKCS-12 X.509 certificates (a digital certificate format used by most Web browsers) to your PGP Desktop keyring, as well as PKCS-7 public X.509 certificates. You can also import Privacy Enhanced Mail (PEM) format X.509 certificates from your browser by copying and pasting into your public keyring.

There are many ways to import someone's PGP public key and add it to your keyring. These methods include:

- Double-clicking the file on your system. If PGP Desktop recognizes the file format, it will open and ask if you want to import the key(s) in the file.
- Choosing to import the key file in PGP Desktop.
- Dragging the file containing the public key onto the PGP Keys window.

PGP Desktop provides an Import Certificate Assistant to help you with this task. For more information, see *Using the Import Certificate Assistant* (on page 59).

Note: If you are using PGP Desktop in a PGP Universal Server-managed environment and you imported an X.509 certificate on a token during enrollment (choosing to import the certificate as a PGP key), you must manually enable the **Synchronize keyring with tokens and smart cards** option. To do this, in PGP Desktop choose **Tools > Options** and click the Keys tab. This step is required in order for the key to work properly with PGP Whole Disk Encryption.

Using the Import Certificate Assistant

X.509 certificates can be imported into PGP Desktop from files, the Windows Personal Certificate store, or smart cards. Even smart card-based certificates which appear in your Windows Certificate store may be imported. The Import Certificate Assistant guides you through the importation process.

When importing certificates from files, the certificate can only be imported from a file with a PEM, PFX, P7b, or P12 extension.

Notes: When using certificates from the Windows Personal Certificate store, you may get prompted for your certificate's password or PIN by Windows itself (or the third-party smart card software, if using smart card-based Windows Personal Certificates).

Some operations, such as changing the certificate's password, are not permitted from within PGP Desktop when using certificates from the Windows Personal Certificate store. Use the Windows (or smart card) software for performing such operations.

To import a certificate using the Import Certificate Assistant

Before You Begin: Make sure that you know the passphrase for the certificate that you are importing.

1. Start the Assistant by:
   - Selecting **File > Open**.
   - Selecting **File > Import Personal Certificates**.
   - Dragging the file containing the public key into the PGP Keys window
2. If you are using PGP Desktop in a PGP Universal Server-managed environment, and your administrator has defined that you can choose the method to import the certificate, select:
   - **Onto an existing key**—the certificate is added to a key that is already in your keyring.
   - **As new PGP key(s)**—a new PGP key is created using the imported certificate.
   - **As PGP X.509 wrapper key(s)**—a new PGP key is created using the imported certificate. PGP Desktop treats the new key as an X.509 certificate.
3. After you make your selection, click **Next**. Either the Certificate Passphrase Entry screen or the PGP Enter Passphrase dialog box displays.
4. Provide the password for the certificate, then click **Next**.
   - If you are importing the certificate using the **Onto an existing key** option, the **Select Key** screen displays. Go to the next step.
   - If you are importing the certificate using the **As new PGP key(s)** option, the key is generated. Click **Finish**. The process is complete.
   - If you are importing the certificate using the **As PGP X.509 wrapper key(s)** option, the Select key(s) dialog box displays. Click to select the key, click Import, and the PGP X.509 wrapper key is generated. The process is complete.
5. To complete importing the certificate using the **Onto an existing key** option, from the Select Key dialog box, select the key onto which you would like to import the certificate, then type the password for the key. Click **Next**.
6. The Key Generation Progress dialog box is displayed as the certificate is imported onto the key.
7. Click **Finish**. The process is complete.

Changing Your Passphrase

It's a good practice to change your passphrase at regular intervals, perhaps every three months. More importantly, you should change your passphrase the moment you think it has been compromised, for example, by someone looking over your shoulder at the keyboard as you typed it in.

To change the passphrase for a split key, you must rejoin it first.

Tip: Changing your passphrase on your key does not change the passphrase on any copies of the key (such as backups you may have made). If you think your key has been compromised, PGP Corporation recommends that you shred any previous backup copies and then make new backups of your key.

If you are in a PGP Universal Server-managed environment and your key mode is SKM, you cannot change the passphrase for your key. SKM keys are protected by a randomly generated passphrase (that is itself protected) and you are never prompted to enter a passphrase for an SKM key. To determine what your key mode is, see *Key Modes* (on page 120).

To change your private key passphrase

1. Open PGP Desktop, click the PGP Keys Control box, and select **My Private Keys**.
2. In the PGP Keys work area, double-click the private key for which you are changing the passphrase. The Key Properties dialog box is displayed.
3. Click **Change Passphrase**. The PGP Passphrase Assistant is displayed.
4. Enter your current passphrase for the private key, then click **Next.** The Create Passphrase dialog box is displayed.
5. Enter your new passphrase in the first text field, and then enter it again in the **Re-Enter Passphrase** field to confirm the new passphrase.

   To display your keystrokes as you type your passphrase, select the **Show Keystrokes** box.

   The Passphrase Quality bar provides a basic guideline for the strength of the passphrase you are creating by comparing the amount of entropy in the passphrase you type against a true 128-bit random string (the same amount of entropy in an AES128 key). For more information, see *The Passphrase Quality Bar* (on page 304).
6. Click **Finish.** Your passphrase is changed.

Deleting Keys, User IDs, and Signatures

PGP Desktop gives you control over the keys on your keyrings, as well as the user IDs and signatures on those keys.

With public keys on your keyrings, you can delete entire keys, any user IDs on a key, and any or all signatures on a key.

With your keypairs, you can delete entire keypairs or any or all signatures, as well as delete user IDs from a keypair as long as that is not the only user ID on the keypair.

Note, however, that you cannot delete a user ID on a key if it is the only user ID, and you cannot delete self-signatures from keys.

To delete a key, user ID, or signature from your PGP keyring

1. Open PGP Desktop, click the PGP Keys Control box, and then click **All Keys** in the Control box. All keys on your keyring appear.
2. Do one of the following:
   - To delete a key, right-click on the key, select **Delete** from the list of commands displayed, then click **OK** on the Confirmation dialog box. The key is deleted from your keyring.
   - To delete a user ID (from a public key) or signature, click the plus sign on the left side of the key to display the user IDs and signatures. When you see the user ID or signature you wish to delete, right-click it, select **Delete** from the list of commands displayed, then click **OK** on the Confirmation dialog. The user ID or signature is deleted.

Disabling and Enabling Public Keys

Sometimes you may want to temporarily disable a public key on your keyring, which can be useful when you want to retain a public key for future use, but you don't want it cluttering up your recipient list every time you send mail.

You cannot disable a keypair that is "implicitly trusted." In order to disable a key that has been set to implicitly trust, you must first change the trust status to **None**.

To disable or enable a public key

1. Open PGP Desktop, click the PGP Keys Control box, and then click **All Keys** in the Control box. All keys on your keyring appear.

2 Double-click the public key you want to disable. The Key Properties dialog box for the key you selected is displayed.

3 Locate the **Enabled** field in the Key Properties.

- If the current **Enabled** setting is **Yes**, the key is enabled. To disable the key, click **Yes** once. The **Enabled** field changes to **No;** the key is disabled.
- If the current **Enabled** setting is **No,** the key is disabled. To enable the key, click **No** once. The **Enabled** field changes to **Yes** and the key is enabled.

A disabled key cannot be used to encrypt or sign. You can use a disabled key, however to decrypt or verify.

Tip: You can also synchronize keys on your keyring with the PGP Universal Server. This option is used primarily to enable/disable public keys on your keyring. To do this, right-click a key and choose **Synchronize**.

Verifying a Public Key

It is difficult to know for certain whether a public key belongs to a particular individual unless that person physically hands the key to you on a removable media or you get the key from the PGP Global Directory. Exchanging keys on removable media is not usually practical, especially for users who are located many miles apart.

So the question remains: how can I make sure the public key I got from a public keyserver (not the PGP Global Directory) is really the public key of the person listed on the key? The answer is: you have to check the key's fingerprint.

There are several ways to check a key's fingerprint, but the safest is to call the person and have them read the fingerprint to you over the phone. Unless the person is the target of an attack, it is highly unlikely that someone would be able to intercept this random call and imitate the person you expect to hear on the other end. You can also compare the fingerprint on your copy of someone's public key to the fingerprint on their original key on a public server.

The fingerprint can be viewed in two ways: in a unique list of words or in its hexadecimal format.

To check the digital fingerprint of a public key

1 Open PGP Desktop, click the PGP Keys Control box, and then click **All Keys** in the Control box.

All keys on your keyring appear.

2 Double-click the public key whose fingerprint you want to check. The Key Properties dialog box for the key you selected is displayed.

The fingerprint of the key is shown under the name and email address, in either hexadecimal format (10 sets of four characters per set) or word list format (four columns with five unique words per column).

3 Compare the fingerprint on the key with the original fingerprint. If the two are the same, then you have the real key. If not, then you do *not* have the real key.

The word list is made up of special authentication words that PGP Desktop uses and are carefully selected to be phonetically distinct and easy to understand without phonetic ambiguity.

The word list serves a similar purpose as the military alphabet, which allows pilots to convey information distinctly over a noisy radio channel.

4 If you have a forged key, delete it.

5 Open your Web browser, navigate to the *PGP Global Directory* (https://keyserver.pgp.com), and search for the real public key.

Signing a Public Key

When you create a keypair, the keys are automatically signed. Similarly, once you are sure a key belongs to the correct person, you can sign that person's public key, indicating that you have verified the key. When you sign someone's public key, a signature icon along with your user name is shown attached to that key.

If you import a keypair from a backup or from a different computer, that keypair may also need to be signed.

Note: If you are using PGP Desktop in a PGP Universal Server-managed environment, key signing may be disabled.

To sign someone's key

1 Open PGP Desktop, click the PGP Keys Control box, and then click **All Keys** in the Control box. All keys on your keyring appear.

2 Do one of the following:

- From the **Keys** menu, select **Sign.**
- Right-click on the key you want to sign and select **Sign** from the list of commands that is displayed.

The PGP Sign Key dialog box is displayed with the user name/email address and hexadecimal fingerprint displayed in the text box.

3 Select the **Allow signature to be exported** checkbox, to allow your signature to be exported with this key.

An exportable signature is one that is allowed to be sent to servers and travels with the key whenever it is exported, such as by dragging it to an email message. The checkbox provides a shorthand means of indicating that you want to export your signature so that others can rely on your signature and trust your keys as a result.

4. Click **More Choices** to configure options such as signature type and signature expiration.
5. Choose a signature type to sign the public key with. Your choices are:
   - **Non-exportable.** Use this signature when you believe the key is valid, but you don't want others to rely on your certification. This signature type cannot be sent with the associated key to a keyserver or exported in any way.
   - **Exportable.** Use exportable signatures in situations where your signature is sent with the key to the keyserver, so that others can rely on your signature and trust your keys as a result. This is equivalent to selecting the **Allow signature to be exported** checkbox on the **Sign Keys** menu.
   - **Meta-Introducer Non-Exportable.** Certifies that this key and any keys signed by this key with a Trusted Introducer Validity Assertion are fully trusted introducers to you. This signature type is non-exportable.
   - **Trusted Introducer Exportable.** Use this signature in situations where you certify that this key is valid, and that the owner of the key should be completely trusted to vouch for other keys. This signature type is exportable. You can restrict the validation capabilities of the trusted introducer to a particular email domain.
6. The **Maximum Trust Depth** option enables you to identify how many levels deep you can nest trusted-introducers. For example, if you set this to 1, there can only be one layer of introducers below the meta-introducer key.
7. If you want to limit the trusted introducer's key validation capabilities to a single domain, type the domain name in the **Domain Restriction** text box.
8. In the **Expiration** field, select **Never** if you don't want this signature to expire or select a date on which it does expire.
9. Click **OK.** The PGP Enter Passphrase for Key dialog box is displayed.
10. Select the key you want to sign with from the list, then type the passphrase of the signing key, if required. (If the passphrase is already cached, you don't need to type it again.)
11. Click **OK.** The key is signed.

Revoking Your Signature from a Public Key

You may, on occasion, want or need to revoke your signature from a key on your keyring.

To revoke your signature

1. Open PGP Desktop, click the PGP Keys Control box, and then click **All Keys** in the Control box. All keys on your keyring appear.
2. Expand the key from which you want to revoke your signature until you see your signing key.
3. Right-click your signing key and then select **Revoke** from the list of commands displayed. The Revoke Signature dialog box is displayed.
4. Verify that the Key ID and Name are the correct key (from which you want to revoke your signature) and click **OK**. The PGP Enter Passphrase for Key dialog box is displayed.
5. Enter your passphrase and click **OK**. Your signature is revoked from the key.

Note: If your signature was exportable and you distributed the key with the exportable signature, you must distribute the key with the revoked signature before others can see the revocation.

Granting Trust for Key Validations

Besides certifying that a key belongs to someone, you can assign a level of trust to the owner of the keys indicating how well you trust them to act as an introducer for others, whose keys you may get in the future.

This means that if you ever get a key from someone that has been signed by an individual whom you have designated as trustworthy, the key is considered valid even though you have not done the check yourself.

You must sign a key before you can set a trust level for it.

Public keys can be **None**, **Marginal**, or **Trusted**. Your keypairs can be **None** or **Implicit** (meaning it is your own key and thus you trust it completely). You shouldn't have anyone else's keypairs.

For more information about trusting keys, see *An Introduction to Cryptography*.

Note: If you are using PGP Desktop in a PGP Universal Server-managed environment, the ability to grant trust to keys may be disabled.

To grant trust to a key

1. Open PGP Desktop, click the PGP Keys Control box, and then click **All Keys** in the Control box. All keys on your keyring appear.
2. Double-click the key for which you are granting trust. The Key Properties dialog box for the key you selected is displayed.
3. Locate the **Trust** field.

4 Click the current setting and select the desired setting from the list.

- If you are granting trust for a public key, you can select **None**, **Marginal**, or **Trusted**. None means you don't trust the owner to act as an introducer, Marginal means you partially trust them, Trusted means you fully trust them.
- If you are granting trust for a keypair, you can select **None** or **Implicit**. Only keypairs that you are importing from backup or from another computer of yours need to have their trust set to Implicit; when you create a keypair, its trust is automatically set to Implicit.

Working with Subkeys

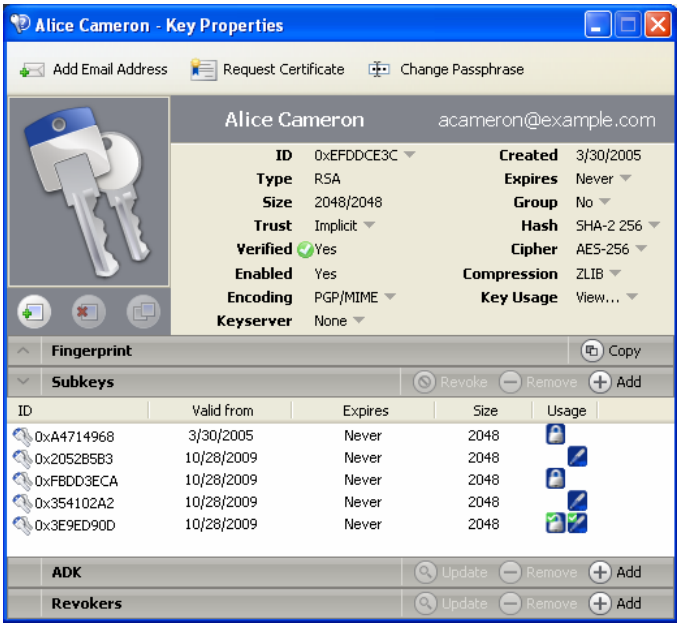
A PGP Desktop keypair consists of these elements:

- the **Master Key**, for signing only;
- one mandatory **Subkey** for encryption;
- one or more *optional* **Separate Subkey(s)** for signing, encryption, or signing/encryption.

The Master Key is used by default for signing, while a subkey is always used for encryption. This can improve the security of a PGP Desktop keypair, as a separate encryption subkey can be revoked, removed, or added to the PGP Desktop keypair without affecting the Master Key or the signatures on it.

In addition to the Master Key and the mandatory encryption subkey, you have the option of creating one or more additional subkeys for your PGP Desktop keypair. You can create any combination of subkeys that can be used for encryption only, for signing only, or for both encryption and signing.

You can view the subkeys of a keypair from the Key Properties dialog box. The Usage column indicates the function that a subkey performs:



Key	Description
	Encryption subkeys display a blue padlock symbol.
	Signing subkeys display a blue pen symbol.
	Subkeys used for both encryption and signing display both symbols.
	The default encryption subkey displays a small green checkmark in the upper left corner.
	The default signing subkey displays a small green check mark in the upper left corner.

Using Separate Subkeys

Here are some examples of how additional separate subkeys can be useful:

- **Multiple encryption subkeys** that are valid during different portions of the keypair's lifetime can increase security. You can create encryption subkeys that have the Start and Expiration dates set so that only one encryption subkey at a time is valid. For example, you could create several encryption subkeys that are valid only during one future year (make sure you specify correct dates). The Encryption Subkey in use then changes with the new year. This can be a useful security measure, as it provides an automatic way to switch to a new encryption key periodically without having to recreate and distribute a new public key. Expired subkeys display a key icon with a red clock.
- **Separate signing subkeys** are needed in regions where separate subkeys for signing are required for legally-binding digital signatures.

The separate subkeys that you can create depend on the type of keypair that you are working with:

- For RSA keypairs, you can create subkeys for encryption, signing, and encryption/signing.
- For Diffie-Hellman/DSS keypairs, you can create subkeys for encryption or signing, but you cannot create subkeys that both encrypt and sign.
- For older PGP Legacy keypairs, subkeys are not supported.

Viewing Subkeys

You can view and change the subkey information on your own keypairs. The subkey information on your keyring's public keypairs can be viewed, but not changed.

To view subkeys and subkey properties

1. Open PGP Desktop, click the PGP Keys control box, then click **All Keys.**

   All keys on your Keyring appear.
2. View the properties of a key by doing one of the following:
   - Double-clicking the key you want to view.
   - Right-clicking on the key, then selecting **Key Properties** from the shortcut menu.
   - Clicking to select the key in the Keyring, then selecting **Keys > Key Properties**.

   The Key Properties dialog box for the key you selected is displayed.
3. Click the **Subkeys** heading in the Key Properties dialog box. The Subkeys for this key are displayed.
4. To view the properties of a subkey, right-click the subkey you want to view and select **Subkey Properties** from the shortcut menu.

Creating New Subkeys

Most likely you will create new subkeys in the manner described in this section. However, you can also create subkeys when you first install PGP Desktop and are using the New Key wizard. For more information, see *Using PGP Desktop for the First Time* (on page 17).

To create new subkeys

1. In the Subkeys section of the Key Properties dialog, click the **Add** button. The New Subkey dialog box is displayed.
2. In the **Use this subkey for** area, select **Encryption**, **Signing**, or **Encryption and Signing**, depending on how you want to use the new subkey.
3. In the **Key Size** field, choose a key size from 1024 to 4096 bits, or type a custom key size from 1024 to 4096 bits.
4. In the **Start Date** field, type a date on which the subkey you are creating becomes effective or choose a date from the calendar.
5. In the **Expiration** area, select **Never**, or select **Date** and specify a date or select a date from the calendar. This information controls when the subkey expires.
6. Click **OK.** The Passphrase dialog box is displayed.
7. Type your passphrase and then click **OK.** The subkey is created.

To specify how the key can be used (such as only for PGP Messaging), see *Specifying Key Usage for Subkeys* (on page 70).

Specifying Key Usage for Subkeys

Each subkey can have its own key usage properties. For example, one subkey could be used for PGP WDE only, and another could be used for all other PGP Desktop functions.

An example of why you would want to set the key usage of a key is when you want to use a key for disk encryption only but you do not want to receive encrypted email. If you distribute your public key that does not allow for PGP Messaging, then email sent by another user would not be encrypted to your public key.

Note: If you are in a PGP Universal Server-managed environment and your key mode is SKM, you cannot make changes to the key usage flags. To determine what your key mode is, see *Key Modes* (on page 120).

To specify key usage

1. Open PGP Desktop, click the PGP Keys control box, then click **All Keys.**

   All keys on your Keyring appear.

2. View the properties of a key by doing one of the following:

   - Double-clicking the key you want to view.
   - Right-clicking on the key, then selecting **Key Properties** from the shortcut menu.
   - Clicking to select the key in the Keyring, then selecting **Keys > Key Properties**.

   The Key Properties dialog box for the key you selected is displayed.

3. Click the **Subkeys** heading in the Key Properties dialog box. The Subkeys for this key are displayed.

4. To view the properties of a subkey, right-click the subkey you want to view and select **Subkey Properties** from the shortcut menu.

5. Under the Key Usage section, select the PGP Desktop functions for which this key can be used. A check next to the item indicates the key can be used for that function.

6. Click **Close** to save the subkey properties.

Revoking Subkeys

To revoke a subkey

1. In the **Subkeys** section of the Key Properties dialog box, select the subkey you want to revoke, then click **Revoke** (above the subkey list). A PGP Warning dialog box is displayed, informing you that once you revoke the subkey, other users will not be able to encrypt data to it.
2. Click **Yes** to revoke the subkey or click **No** to cancel. The Passphrase dialog box is displayed.
3. Type your passphrase, then click **OK**. The subkey is revoked and the icon changes.

Removing Subkeys

To remove a subkey

1. In the **Subkeys** section of the Key Properties dialog box, select the subkey you want to remove, then click **Remove** (above the subkey list). A **PGP Warning** dialog is displayed, informing you that once you remove the subkey, you will not be able to decrypt information encrypted to it.
2. Click **Yes** to remove the subkey or click **No** to cancel. The subkey is removed.

Working with ADKs

An additional decryption key (ADK) is a key generally used by security officers of an organization to decrypt messages that have been sent to or from employees within the organization.

Messages encrypted by a key with an ADK are encrypted to the public key of the recipient and to the ADK, which means the holder of the ADK can also decrypt the message.

ADKs are rarely used or needed outside of a PGP Universal Server-managed environment. Although your PGP administrator should not ordinarily need to use the additional decryption keys, there may be circumstances when it is necessary to recover someone's email. For example, if someone is injured and out of work for some time, or if email records are subpoenaed by a law enforcement agency and the corporation must decrypt mail as evidence for a court case.

You can only modify ADKs on your keypairs.

Adding an ADK to a Keypair

▸ **To add an ADK**

1. Open PGP Desktop, click the PGP Keys Control box, and then click **My Private Keys** in the Control box. The private keys on your keyring appear.
2. Double-click the key to which you are adding an ADK. The Key Properties dialog box for the key you selected is displayed.
3. Click the up-arrow to the left of **ADK**, if applicable (only those keys that already have at least one ADK already assigned will have the up-arrow). The ADK information for this key is displayed, if configured.
4. Click the plus sign icon on the right side of the ADK section. The Select Key(s) dialog box is displayed.
5. Select the key you want to use as the ADK, then click **OK.** A PGP Warning dialog box is displayed, asking if you are sure you would like to add the selected key as an ADK.
6. Click **Yes**. The PGP Enter Passphrase for Key dialog box is displayed.
7. Type the passphrase for the key to which you are adding the ADK, then click **OK**. A PGP Information dialog box is displayed, telling you the ADK was added to the key.
8. Click **OK**.

Note: If add an ADK to your key, then those who send you encrypted email must be able to access the public key portion of the ADK.

Updating an ADK

▸ **To update an ADK**

1. Select the ADK you want to update from the list of ADKs. The selected ADK highlights.
2. Click the down arrow icon. The ADK is updated.

Removing an ADK

▸ **To remove an ADK**

1. Select the ADK you want to remove from the list of ADKs. The selected ADK highlights.

2 Click the minus sign icon. A PGP Warning dialog box is displayed, asking if you are sure you want to remove the ADK.

3 Click **OK** to remove the ADK. The ADK is removed.

Working with Revokers

It is possible that one day you might forget your passphrase or lose your keypair (your laptop is stolen or your hard drive crashes, for example).

Unless you are also using Key Reconstruction and can reconstruct your private key, you would be unable to use your key again, and you would have no way of revoking it to show others not to encrypt to it. To safeguard against this possibility, you can appoint a third-party key revoker. The third-party you designate is then able to revoke your key just as if you had revoked it yourself.

This feature is available for both Diffie-Hellman/DSS and RSA keys.

You can only change revoker information on your keypairs. If a public key on your keyring has a revoker, you can see that information but you cannot change it.

Appointing a Designated Revoker

To add a designated revoker to your key

1 Open PGP Desktop, click the PGP Keys Control box, and then click **My Private Keys** in the Control box. The private keys on your keyring appear.

2 Double-click the key to which you are adding a revoker. The Key Properties dialog box for the key you selected is displayed.

3 Click the plus sign to the left of **Revokers**, if applicable (only those keys that already have at least one revoker configured will have the plus sign). The Revokers information for this key is displayed, if configured.

4 Click the plus sign icon on the right side of the Revokers section. The Select key(s) dialog box is displayed.

5 Select the key you want to use as the Revoker key, then click **OK.**

A PGP Warning dialog box is displayed, asking if you are certain that you want to grant revoker privileges to the selected key(s).

6 Click **Yes** to continue or **No** to cancel. The PGP Enter Passphrase for Key dialog box is displayed.

7 Type the passphrase for the keypair to which you are adding the revoker, then click **OK.** A PGP Information dialog box is displayed.

8 Click **OK.** The selected key(s) is now authorized to revoke your key. For effective key management, distribute a current copy of your key to the revoker(s) or upload your key to the keyserver.

Revoking a Key

If the situation ever arises that you no longer trust your personal keypair, you can revoke your key, which tells everyone to stop using your public key.

The best way to circulate a revoked key is to place it on a public keyserver.

To revoke a key

1 Open PGP Desktop, click the PGP Keys Control box, and then click **My Private Keys** in the Control box. The private keys on your keyring appear.

2 Right-click the key you want to revoke, then select **Revoke** from the list of commands displayed. A PGP Warning dialog box is displayed, asking if you are sure you want to revoke this key.

3 Click **Yes** to confirm your intent to revoke the selected key or **No** to cancel. The PGP Enter Passphrase for Key dialog box is displayed.

4 Type the passphrase for the keypair you are revoking, then click **OK.** When you revoke a key, it is marked out with a red X to indicate that it is no longer valid.

5 Synchronize the revoked key so everyone will know not to use the now revoked public key.

Splitting and Rejoining Keys

Any private key can be split into shares among multiple "shareholders" using a cryptographic process known as Blakely-Shamir key splitting. This technique is recommended for extremely high security keys.

For example, PGP Corporation keeps a corporate key split between multiple individuals. Whenever we need to sign with that key, the shares of the key are rejoined temporarily.

Creating a Split Key

When you split a key, the shares are saved as files either encrypted to the public key of a shareholder or encrypted conventionally if the shareholder has no public key. After the key has been split, any attempts to sign or decrypt with it will automatically attempt to rejoin the key.

To create a split key with multiple shares

1. Open PGP Desktop, click the PGP Keys Control box, and then click **My Private Keys** in the Control box. The private keys on your keyring appear.
2. Click on the keypair you want to split. The selected keypair highlights.
3. Select **Keys > Share Key > Make Shared.** The Shared PGP Key dialog box is displayed.
4. Add shareholders for the split key by dragging and dropping their keys in the **Shareholder** list.

   To add a shareholder that does not have a public key, click **Add**, type the person's name, then allow the person to type in their passphrase. (The shareholder needs to be physically present in order to type their own passphrase.)
5. When all of the shareholders are listed, you can specify the number of key shares that are necessary to decrypt or sign with this key.

   By default, each shareholder is responsible for one share. To increase the number of shares a shareholder controls, click the name in the shareholder's list and then use the arrows to adjust the number of shares.
6. Click **Split Key.** You are prompted to select a directory in which to store the shares.
7. Select a location to store the key shares, then click **OK.** The Passphrase screen is displayed.
8. Enter the passphrase for the key you want to split, then click **OK**. A confirmation dialog box is displayed.
9. Click **Yes** to split the key. The key is split and the shares are saved in the location you specified. Each key share is saved with the shareholder's name as the file name and an SHF extension.
10. Distribute the key shares to the owners, then delete the local copies of the shares.

    Once a key is split among multiple shareholders, attempting to sign or decrypt with it will cause PGP Desktop to automatically attempt to rejoin the key.

Be sure you keep the original key that was split. You will need to have this key before you can rejoin the split key for any decryption functions.

Rejoining Split Keys

Once a key is split among multiple shareholders, attempting to sign or decrypt with it causes PGP Desktop to attempt to rejoin the key automatically. There are two ways to rejoin the key: locally and remotely.

Rejoining key shares locally requires the shareholder's presence at the rejoining computer. Each shareholder is required to enter the passphrase for their key share.

Rejoining key shares remotely requires the remote shareholders to authenticate and decrypt their keys before sending them over the network. The PGP Desktop Transport Layer Security (TLS) feature provides a secure link to transmit key shares, allowing multiple individuals in distant locations to securely sign or decrypt with their key share.

Caution: Before receiving key shares over the network, you should verify each shareholder's fingerprint and sign their public key to ensure that their authenticating key is legitimate.

Before you begin, be sure you have the original key that was split on the rejoining computer.

To rejoin a split key

1. Contact each shareholder of the split key. To rejoin key shares locally, the shareholders of the key must be present.

   To collect key shares over the network, make sure the remote shareholders have PGP Desktop installed and are prepared to send their key share file. Remote shareholders must have:

   - their key share files and passwords
   - a keypair (for authentication to the computer that is collecting the key shares)
   - a network connection
   - the IP address or Fully Qualified Domain Name of the computer that is collecting the key shares

2. Do one of the following:

   - To temporarily rejoin the key, at the rejoining computer, use Windows Explorer to select the file(s) that you want to sign or decrypt with the split key.

     Right-click on the file(s) and select **Sign or Decrypt** from the PGP shortcut menu. The **PGP Enter Passphrase for Selected Key** screen is displayed with the split key selected.

     Click **OK** to reconstitute the selected key. The Key Share Collection screen is displayed.

   - To permanently rejoin the key, right-click the split key and select **Key Properties** from the menu displayed.

     In the Key Properties dialog box, click J**oin Key** (this button is labeled **Change Passphrase** for keys that are not split).

   The Passphrase dialog box is displayed.

3. Do one of the following:

- If you are collecting the key shares locally, click **Select Share File** and then locate the share files associated with the split key. The share files can be collected from the hard drive, a diskette, or a mounted drive. Continue with the next step.
- If you are collecting key shares over the network, click **Start Network**. The remote user must start PGP Desktop and select **Keys > Share Key > Send Key Share**. This starts the process of selecting the share file, decrypting the share file, selecting an authorization key, unlocking the authorization key, and entering the hostname/IP address of the joining computer.

In the Signing Key field, select the keypair that you want to use for authentication to the remote system and enter the passphrase.

Click **OK** to prepare the computer to receive the key shares.

The status of the transaction is displayed in the Network Shares box. When the status changes to "Listening," the PGP application is ready to receive the key shares.

At this time, the shareholders must send their key shares.

When a share is received, the Remote Authentication dialog box is displayed. If you have not signed the key that is being used to authenticate the remote system, the key is considered invalid. Although you can rejoin the split key with an invalid authenticating key, it is not recommended. You should verify each shareholder's fingerprint and sign each shareholder's public key to ensure that the authenticating key is legitimate.

4. Click **Confirm** to accept the share file.
5. Continue collecting key shares until the value for Total Shares Collected matches the value for Total Shares Needed on the Key Shares Collection screen.
6. Click **OK.**
   - If you elected to temporarily rejoin the key in order to decrypt or sign, the file is signed or decrypted with the split key and the rejoined key is discarded.
   - If you elected to permanently rejoin the key, the key is saved as a fully rejoined key (and is no longer split).

If You Lost Your Key or Passphrase

If you lost your key, you can reconstruct your key so you can continue to encrypt and decrypt data. How you do this depends on if you are using PGP Desktop in a standalone environment or in a PGP Universal Server-managed environment.

If you forgot your passphrase, you can reset your passphrase. To do this, you answer correctly three of the five security questions you answered when you set up your key or created your security questions.

Reconstructing Keys with PGP Universal Server

This section applies only to PGP Desktop users in a PGP Universal Server-managed environment whose PGP administrator has configured key reconstruction support for their copy of PGP Desktop.

If you lose your key or forget your passphrase and do not have a backed up copy from which to restore your key, you will never again be able to decrypt any information encrypted to your key. You can, however, reconstruct your key if your PGP administrator has implemented a PGP key reconstruction policy for you, in which your key is encrypted and stored on a PGP Universal Server in such a way that only you can retrieve it.

The PGP Universal Server holding the key reconstruction data stores your key in such a way that only you can access it. Not even the PGP administrator has the ability to decrypt your key.

If your PGP administrator has configured support for key reconstruction, you will be prompted to enter additional "secret" information when you install PGP Desktop or when you create your security questions.

Once your key is on the server, you can restore it at anytime by selecting **Keys > I Lost My Key** or **Keys > I Forgot My Passphrase** in PGP Desktop for Windows, or **Keys > Reconstruct** in PGP Desktop for Mac OS X.

Tip: If you were not prompted to create your PGP questions during installation of PGP Desktop, and your PGP Universal Server administrator allows local key reconstruction, you can manually create your questions. For more information, see *Creating Your Security Questions* (on page 80).

Creating Key Reconstruction Data

When you answer the PGP security questions, you are creating the key reconstruction data. In a standalone environment, this information is stored on your local disk in a .krb file. In a managed environment, you send the key reconstruction data to your company's PGP Universal Server whenever you install PGP Desktop or when you create and answer your security questions.

Choose obscure personal questions with answers that you are not likely to forget. Your questions can be up to 95 characters in length. An example of a good question might be, "Who took me to the beach?" or "Why did Fred leave?" An example of a bad question would be, "What is my mother's maiden name?" or "Where did I go to high school?"

When you have created and answered all five PGP questions, your private key is split into five pieces, using Blakely-Shamir key splitting. Three of the five pieces are needed to reconstruct the key. Each piece is then encrypted with the hash, the uniquely identifying number, of one answer. If you know any three answers, you can successfully reconstruct the whole key.

Creating Your Security Questions

Before you can reconstruct your key or create a new passphrase when you've forgotten it, you must create your security questions. You can customize the five security questions so that the answers are something that only you would know.

To create your security questions

1. In PGP Desktop, click the PGP Keys Control box and then select your key.
2. Select **Keys > Create My PGP Questions**. The PGP Security Question Assistant is displayed.
3. Enter the passphrase for your key and click **Next**. The Create Security Question 1 of 5 dialog box is displayed.

PGP Security Question Assistant
PGP Desktop
Create Security Question 1 of 5
PGP Desktop requires you answer a set of five questions about your life when recovering a forgotten passphrase or lost key. Consider your questions and answers carefully so that you can recall them in the future. Do not write them down.
1
What was the first car that I ever purchased for myself?
2
Personalize Your Question
What was the first car that I ever purchased for myself?
3
Answer Your Question
Enter brand name
< Back
Next >
Cancel
Help

4. In the first Create Security Question screen, click the arrow for the first field to select the question you want to use. Note that you can customize parts of the question in the next step.

   If you want to completely customize the question to create your own question, select **Enter my own question**.

5 For **Personalize Your Question**, click the arrows next to any of the text that you can customize. For example, if you selected the first question, you can customize that question by changing "friend" to "boy" and "had a crush on" to "held hands with."

If you chose to create your own question, enter the question in this field. Be sure to enter a question that only you can know the answer to.

6 For **Answer Your Question**, enter the answer to this security question. You can enter the answer using mixed upper- and lowercase letters, or use all one case (when you answer the question, the case will not matter).

A hint is displayed in this field that disappears once you start entering the answer. For example, to answer the question "Who was the first boy that I ever held hands with?", the hint is "Enter first and last name".

7 When you have defined your question and entered the answer, click **Next** to continue. The Create Security Question 2 of 5 dialog box is displayed.

8 You are prompted to create and answer a total of five security questions. Continue to follow the steps above to select the question, customize the question, and answer the question.

When you have entered all five questions and answers, the Completing the PGP Security Question Assistant screen is displayed. Click **Finish** to exit the assistant.

You have now defined the five security questions. If you lost your key or forget your passphrase, you can reconstruct your key or reset your passphrase by answering three of these five questions.

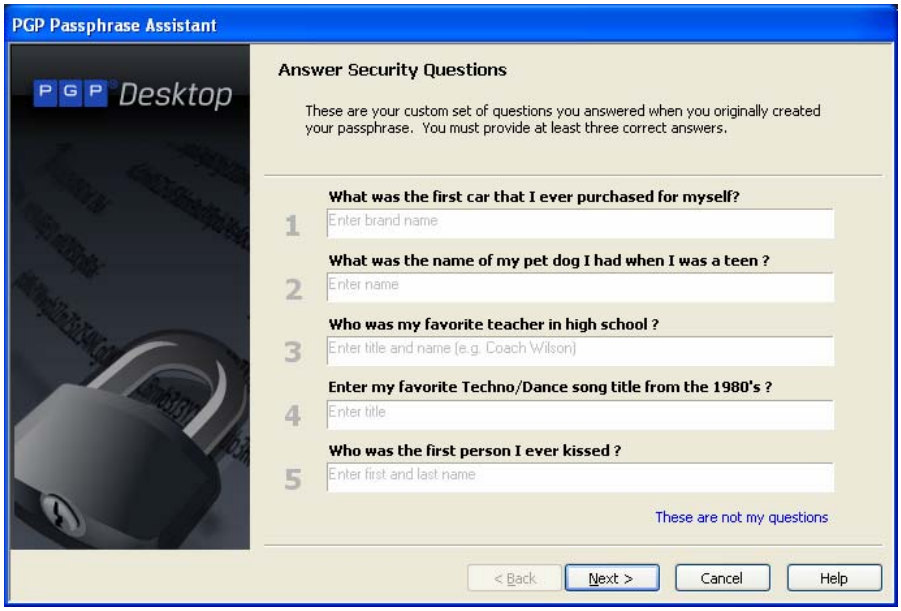
Reconstructing Your Key if You Lost Your Key or Passphrase

If you have lost your key or have forgotten your passphrase, you can recover by reconstructing your key. You must first have created a set of security questions that only you can answer. For more information, see *Creating Your Security Questions* (on page 80).

To reconstruct your key

1 In PGP Desktop, click the PGP Keys Control box and then select your key.

2 Select **Keys > I Lost My Key**. The PGP Passphrase Assistant: Answer Security Questions dialog box is displayed.


PGP Passphrase Assistant
PGP Desktop
Answer Security Questions
These are your custom set of questions you answered when you originally created your passphrase. You must provide at least three correct answers.
What was the first car that I ever purchased for myself?
1
Enter brand name
What was the name of my pet dog I had when I was a teen ?
2
Enter name
Who was my favorite teacher in high school ?
3
Enter title and name (e.g. Coach Wilson)
Enter my favorite Techno/Dance song title from the 1980's ?
4
Enter title
Who was the first person I ever kissed ?
5
Enter first and last name
These are not my questions
< Back
Next >
Cancel
Help

Tip: If the questions displayed are not your questions, click the link for These are not my questions. The PGP Passphrase Assistant: Select Key to Reconstruct dialog box is displayed. Select the Key ID of the key you want to reconstruct and click **Next**.

3 Answer three of the five security questions correctly and click **Next**. The PGP Passphrase Assistant: Success dialog box is displayed.

4 Click **Next**. to continue with creating a new passphrase. The PGP Passphrase Assistant: Create Passphrase dialog box is displayed.

5 Enter and re-enter your passphrase.

Select **Show Keystrokes** if you want to see the characters you type for your passphrase. Be sure no one can see what you type.

The Passphrase Quality bar provides a basic guideline for the strength of the passphrase you are creating by comparing the amount of entropy in the passphrase you type against a true 128-bit random string (the same amount of entropy in an AES128 key). For more information, see *The Passphrase Quality Bar* (on page 304).

6 Click **Finish**. Your key has been reconstructed.

Protecting Your Keys

Besides making backup copies of your keys, you should be especially careful about where you store your private key. Even though your private key is protected by a passphrase that only you should know, it is possible that someone could discover your passphrase and then use your private key to decipher your email or forge your digital signature. For instance, somebody could look over your shoulder and watch the keystrokes you enter or intercept them on the network or even over the Internet.

To prevent anyone who might happen to intercept your passphrase from using your private key, store your private key only on your own computer. If your computer is attached to a network, make sure that your files are not automatically included in a system-wide backup where others might gain access to your private key. Given the ease with which computers are accessible over networks, if you are working with extremely sensitive information, you may want to keep your private key on a flash drive, which you can insert like an old-fashioned key whenever you want to read or sign private information.

As another security precaution, consider assigning a different name to your private keyring file and then storing it somewhere other than in the default location.

Your private and public keys are stored in separate keyring files. You can copy them to another location on your hard drive or to a diskette. By default, the private keyring (`secring.skr`) and the public keyring (`pubring.pkr`) are stored along with the other program files in your "PGP" folder; you can save your backups in any location you like.

You can configure PGP Desktop to back up your keyrings automatically after you close PGP Desktop. Your keyring backup options can be set in the Keys tab of the Options dialog box (for Windows systems) or the Preferences dialog box (for Mac OS X systems).

Tip: If you have changed your passphrase on your key, remember that it does not change the passphrase on any copies of the key (such as backups you may have made). If you think your key has been compromised, PGP Corporation recommends that you shred any previous backup copies and then make new backups of your key.

7 Securing Email Messages

This section describes how to use PGP Desktop Email to automatically and transparently secure your email messages.

Note: If you are using PGP Desktop in a PGP Universal Server-managed environment, your PGP Universal Server administrator may have disabled certain features. When a feature is disabled, the control item in the left side is not displayed and the menu and other options for that feature are not available. The graphics included in this guide depict the default installation with all features enabled. If your PGP Universal Server administrator has disabled this functionality, this section does not apply to you.

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Creating a New Security Policy 101
Working with the Security Policy List 112
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Key Modes 120
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How PGP Desktop Secures Email Messages

When secure email messaging is enabled, PGP Desktop monitors the email traffic between your email client and your mail server. Depending on the circumstances, PGP Desktop will intercede on your behalf to encrypt, sign, decrypt, or verify messages.

Once configured correctly—and it's very likely PGP Desktop can do that for you automatically—you don't have to do anything to encrypt and/or sign outgoing messages or to decrypt and/or verify incoming messages; the PGP Desktop messaging proxy does it for you.

How this happens is different for incoming and outgoing messages.

For incoming messages, PGP Desktop automatically evaluates all incoming email messages and takes the appropriate actions (described in the following section).

For outgoing messages, there are a range of actions that PGP Desktop can take on your behalf based on configured policies. A policy is a set of instructions (such as "In this circumstance, to this") that tells PGP Desktop what to do in specific situations. By combining these instructions, policies can be tailored to meet all of your email security requirements. PGP Desktop comes pre-configured with a set of policies that suit the needs of the vast majority of users. However, you are also provided with fine-grained control over these policies if you want to change them.

By default, when you are using PGP Desktop standalone and are sending an outgoing message, PGP Desktop looks for a key it can trust to encrypt the message. It looks first on the default keyring (called "All Keys" on Windows systems) or the local keyring (called "Keys" on Mac OS X systems) for the public key of the recipient. If it does not find such a key, it will, again by default, check the PGP Global Directory for a trusted key for the recipient. If it does not find a trusted key there, the message is sent in the clear, which is unencrypted. This default behavior, called *Opportunistic Encryption,* strikes a balance between protecting outgoing messages and making sure they get sent.

Creating new policies is covered in detail in *Creating a New Security Policy* (on page 101).

If you are in a PGP Universal-protected domain, your local PGP Desktop policies determine how your messages are encrypted and when. For more information, consult with your organization's PGP Universal Server administrator.

Note: PGP Desktop checks only the default keyring. To send encrypted email to a recipient whose key is on your local keyring, be sure to import the key to your default keyring.

If you have multiple keyrings, the default keyring is the first keyring listed in the PGP Keys control box. To specify a different default keyring, right-click the keyring in the PGP Keys control box, choose Properties, and select the **Default Keyring** checkbox.

Incoming Messages

PGP Desktop manages incoming mail messages based on the content of the message. **These scenarios assume standalone PGP Desktop, not in a domain protected by a PGP Universal server** (in which case mail action policies set by your PGP Universal Server administrator can apply):

- **Message not encrypted nor signed.** PGP Desktop does nothing to the content of these messages; it simply passes the message along to your email client.

- **Message encrypted, but not signed.** When PGP Desktop sees a message coming to you that is encrypted, it will attempt to decrypt it for you. To do this, PGP Desktop will check the local keyring for the private key that can decrypt the message. If the private key is not on the local keyring, PGP Desktop will not be able to decrypt it; the message will be passed to your email client still encrypted. If the private key *is* on the local keyring, PGP Desktop will decrypt it immediately if the passphrase for the private key is in memory (cached). If the passphrase is not cached, PGP Desktop will prompt you for the passphrase and decrypt the message when you supply the correct passphrase. Once a message is decrypted, PGP Desktop passes it to your email client.

  If the PGP Desktop messaging proxy is turned off, PGP Desktop will not be able to decrypt incoming encrypted messages; it will pass them along to your email client still encrypted. It is recommended that you leave your messaging proxy on all the time if you expect to be sending and receiving encrypted messages. On is the default setting.

- **Message signed, but not encrypted.** PGP Desktop will search the local keyring for a public key that can be used to verify the signature. If PGP Desktop cannot find the appropriate public key on the local keyring, it will try to search for a keyserver at keys.domain (where **domain** is the domain of the sender of the message), then the *PGP Global Directory* (https://keyserver.pgp.com), and finally any other configured keyservers. If PGP Desktop finds the right public key at any of these locations, it verifies the signature (or not, if the signature is bad) and passes the message to your email client annotated with information about the signature—information is also put into the PGP Log. If PGP Desktop cannot find the appropriate public key, it passes the message to your email client unverified.

- **Message encrypted and signed.** PGP Desktop goes through both of the processes described above: first finding the private key to decrypt the message and then finding the public key to verify the signature. However, if a message cannot be decrypted, then it cannot be verified.

If PGP Desktop is unable to either decrypt or verify a message, you might want to consider contacting the sender of the message. If the message could not be decrypted, make sure the sender was using your real public key. If the message could not be verified, ask the sender to publish their key on the PGP Global Directory — older PGP versions or other OpenPGP products can access the web version of this directory at *PGP Global Directory* (https://keyserver.pgp.com) , or ask them to send their public key to you directly by email.

Note: PGP Desktop only encrypts by default to keys that are known to be valid. If you did not get a key from the PGP Global Directory, you may need to verify its fingerprint with the owner and sign it for it to be used.

Outgoing Messages

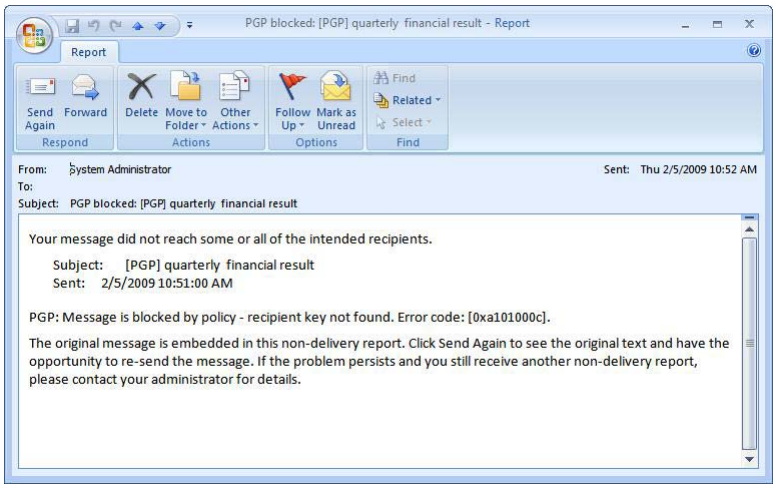
Email messages that you send can be encrypted, signed, both, or neither. Because you probably have different combinations for different recipients or email domains, you need to create policies for all of your outgoing email message possibilities. Once correct policies are in place, your email messages are protected automatically and transparently.

If you are in a PGP Universal Server-managed environment, your PGP Desktop policies are controlled by the policies specified by your PGP Universal Server administrator. Your administrator may also have specified how to handle outgoing email messages if the PGP Universal Server is not available. These policies are called offline (or local) policies.

Sending MAPI Email with Microsoft Outlook

New in PGP Desktop version 9.10 is the ability to "spool" outgoing messages so that you can continue to work in email without having to wait for the PGP Notifier message to disappear.

When a key is not found, instead of displaying the message in a PGP Notifier and then displaying the outgoing message (so that you can modify it to remove the recipient, for example), a "key not found" non-delivery report is generated and sent. This is in the format of an incoming email message and is sent from the "System Administrator" and provides information on why the email did not reach some or all of the intended recipients.


PGP blocked: [PGP] quarterly financial result - Report
Report
Send Again
Forward
Delete
Move to Folder
Other Actions
Follow Up
Mark as Unread
Find
Related
Select
Respond
Actions
Options
Find
From: System Administrator
Sent: Thu 2/5/2009 10:52 AM
To:
Subject: PGP blocked: [PGP] quarterly financial result
Your message did not reach some or all of the intended recipients.
Subject: [PGP] quarterly financial result
Sent: 2/5/2009 10:51:00 AM
PGP: Message is blocked by policy - recipient key not found. Error code: [0xa101000c].
The original message is embedded in this non-delivery report. Click Send Again to see the original text and have the opportunity to re-send the message. If the problem persists and you still receive another non-delivery report, please contact your administrator for details.

The most common messages contained in a non-delivery report include:

- PGP: Message is blocked by policy - server not reachable.
- PGP: Message is blocked - additional decryption key not found.
- PGP: Message is blocked - failed to unlock signing key.
- PGP: Message is blocked - failed to find key by KeyID.

- PGP: Message is blocked - blocked from notifier.
- PGP: Message is blocked by policy - recipient key not found.
- PGP: Message is blocked by policy.

Contact your PGP Universal Server administrator for assistance with policy issues.

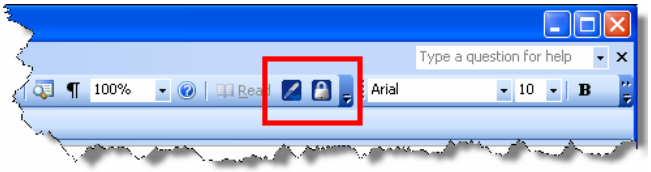
Using the Sign and Encrypt Buttons in Microsoft Outlook

In PGP Desktop for Windows 10.0, a new feature is available for Microsoft Outlook 2002 SP3, 2003 (XP) SP3, and 2007 when used with Microsoft Exchange (MAPI) and SMTP email accounts. This new feature provides buttons to explicitly sign, encrypt, or sign and encrypt an email message. This feature satisfies compliance with signature regulations, such as for the European Union, that require users to consciously sign email messages.

The **Sign** and **Encrypt** buttons are available for both managed and standalone installations of PGP Desktop.

- In standalone environments, enable or disable the Sign and Encrypt buttons in the Options dialog box. To do this, select **Tools > Options**, select the Messaging tab, and select (or deselect) the option to **Enable PGP encrypt and sign buttons in Outlook**. The buttons are disabled by default.
- If you are using PGP Desktop in a managed environment, your PGP Universal Server administrator will have specified if this feature is available and may have disabled this feature by policy.

When enabled in Microsoft Outlook 2002/2003, both buttons appear on the toolbar:



When enabled in Microsoft Outlook 2007, both buttons appear on the Message ribbon:

Outgoing email policy determines how the email message is sent. There are three new default policies included in new installations of PGP Desktop to support these buttons. For existing installations, these three default policies must be created. For more information on the policy settings, see *Security Policy Information and Examples* (on page 108).

The **Sign** and **Encrypt** buttons are an additional feature where you have control over which email needs to be encrypted and/or signed. The buttons are not a replacement for the email proxying used in PGP Desktop.

Note: If you reply to or forward an email message that you want to encrypt and/or sign, be sure to select the appropriate buttons. Fowards or replies are treated as new messages and require you explicitly select the options to secure the message.

Use the following procedure whether you are creating a new email message, or forwarding or replying to an email message.

To sign, encrypt, or sign and encrypt a email message

1 Begin composing your email message.

2 Do one of the following:

- To sign only, click **Sign** ( ). Note that when you choose to sign only, the email will be sent in cleartext.
- To encrypt only, click **Encrypt** ( ).
- To sign *and* encrypt, click both **Sign** and **Encrypt** ( ).

Tip: If you have selected one or both buttons and then save the email message as a draft, the buttons remain selected when you continue composing the message.

3 Continue composing your email message and send it. The PGP Desktop notifier displays the result of sign and/or encrypt process (for more information on notifiers, see *Outgoing PGP Desktop Notifier Messages* (on page 36)).

Using Offline Policy

If you are using PGP Desktop in a PGP Universal Server-managed environment, the offline mail policy is defined by your PGP Universal Server administrator. This policy defines what happens to email messages when the PGP Universal Server is offline or cannot be reached by PGP Desktop.

- **Block outbound messages**. Your outbound messages are not sent. If the messages can be queued by your mail client, they stay in the queue until the PGP Universal Server is available. If the messages cannot be queued, the email messages are blocked.
- **Send outbound messages in the clear**. You are prompted to choose if you want to allow the email message to be sent unsecured. If you choose to send, the message is sent in the clear. If you choose not to send, the message is blocked.

- **Follow standalone policy**. PGP Desktop follows the standalone policy to process your outbound messages. For more information, see *Viewing Services and Policies* (on page 92).

For information on the notifiers you receive when any of the above occurs, see *Outgoing PGP Desktop Notifier Messages for Offline Policy* (on page 36).

Your PGP Universal Server administrator can specify how often your mail policies get downloaded to PGP Desktop. When you are in offline mode, the last downloaded offline mail policy remains in effect for processing your outbound email messages. If you have been in offline mode for a period of time that is longer than the grace period allowed for the offline standalone mail policy to be in effect, your administrator could have also specified how outgoing email should be processed. In this case, PGP Desktop can start blocking your outbound messages or the same offline standalone mail policy can be used for processing your outbound messages, depending on how policy is defined by your administrator.

When you have been offline for some time, you can manually request a download of policy from the PGP Universal Server once you are back online. To do this when you are back online, select the PGP Desktop icon in the tray and then select **Update Policy**. The latest policies are downloaded from the PGP Universal Server and any client logs are uploaded to the server. The option to manually update a policy is available for managed users only.

If your PGP Universal Server administrator allows you to use standalone policies, see *Creating a New Security Policy* (on page 101).

Services and Policies

To understand how to use PGP Desktop to automatically and transparently protect your outgoing messages, you need to understand two terms: service and policy.

- **Service**. Information about one email account on your system and the policies that apply to that account. In most cases, PGP Desktop will automatically create and configure a service for each email account on your system. In some circumstances, you may want to create and configure a service manually.
- **Policy**. A set of one or more instructions that tell PGP Desktop what to do in specific situations. Policies are associated with services—often more than one (a policy can be reused by different services). Conversely, a service can (and usually does) have more than one policy.

When deciding how to handle a specific outgoing email message, PGP Desktop checks the policies configured for the service one at a time (from the top of the list going down). When it finds a policy that applies, it stops checking policies and implements the one that applies.

All new services are created with the following default policies:

- **Encrypt and Sign Buttons**. Specifies that email is both signed and encrypted when both the **Encrypt** and **Sign** buttons are enabled in Microsoft Outlook 2002, 2003, or 2007. This policy is available only on PGP Desktop for Windows.
- **Sign Button**. Specifies that email is signed when the **Sign** button is enabled in Microsoft Outlook 2002, 2003, or 2007. This policy is available only on PGP Desktop for Windows.
- **Encrypt Button**. Specifies that email is encrypted when the **Encrypt** button is enabled in Microsoft Outlook 2002, 2003, or 2007. This policy is available only on PGP Desktop for Windows.
- **Mailing List Admin Requests**. Specifies that administrative requests to mailing lists are sent in the clear; that is, not encrypted or signed.
- **Mail List Submissions**. Specifies that submissions to mailing lists are sent signed (so they can be authenticated) but not encrypted.
- **Require Encryption: [PGP] Confidential**. Specifies that any message flagged as confidential in your email client or containing the text "[PGP]" in the subject line **must** be encrypted to a valid recipient public key or it cannot be sent.
- **Opportunistic Encryption**. Specifies that any message for which a key to encrypt cannot be found should be sent without encryption (in the clear). Having this policy as the **last** policy in the list ensures that your messages will always be sent, albeit in the clear, even if a key to encrypt it to the recipient cannot be found.

  Do not put Opportunistic Encryption first in the list of policies (or anywhere but last, for that matter) because when PGP Desktop finds a policy that matches, and Opportunistic Encryption matches everything, it stops searching and implements the matching policy. So if a policy is lower on the list than Opportunistic Encryption, it will never be implemented.

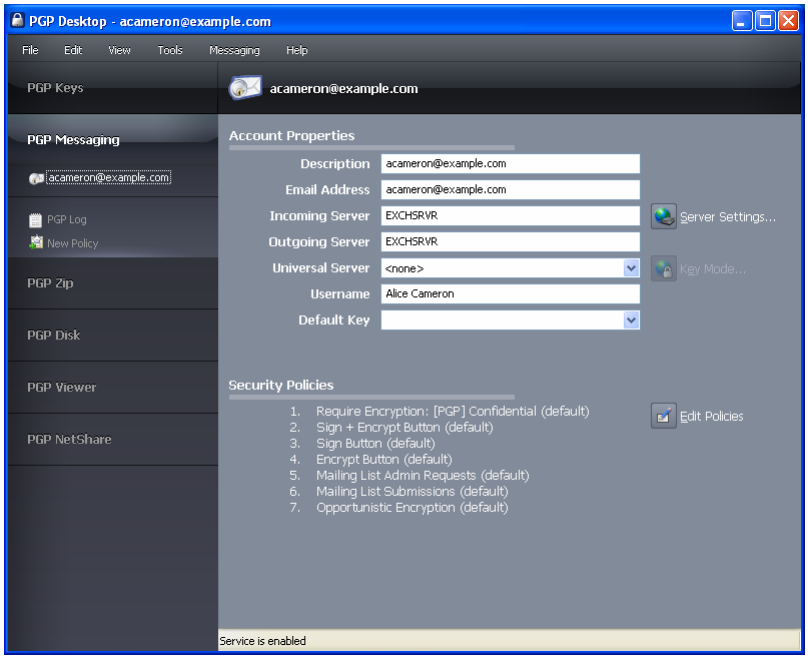
Note: The default policies can be modified, but not deleted. Alternatively, they can be disabled, then moved up or down in the list of policies.

Viewing Services and Policies

To view services and policies

1. Open PGP Desktop.
2. Click the PGP Messaging Control box. The PGP Messaging Control box highlights. All currently configured services are listed at the top of the PGP Messaging Control box.

3 Click on a service to see the account properties and the security policies that are part of the service. This section provides information on what security policy is being enforced. If you are managed by a PGP Universal Server, the security policies are set by your administrator.



If you are using PGP Desktop in a PGP Universal Server-managed environment, different messages and/or options may be displayed above the list of policies depending on how policy is set.

If PGP Universal Server Policy is:	Message displayed in PGP Desktop above the list of policies is:
Offline policy is set to block	"Messages will be blocked when the server is unreachable."
Offline policy is set to send in clear	"Messages will be sent in the clear when the server is unreachable."
Offline policy is set to standalone	"Standalone policies will be enforced when the server is unreachable." A checkbox is available to **Display standalone policies**.
Policy is set to standalone	"The following standalone policies will be enforced."

In all cases, if your administrator has specified you can override policy, a checkbox is available to **Override server policies with local policies**.

Creating a New Messaging Service

A service is information about an email account, as well as the security policies that are to be applied to outgoing messages for that email account.

Important: In most cases, PGP Desktop creates services for you as you use your email accounts to send or receive messages. If you need to create a service yourself, make sure to read and understand these instructions. Incorrect configuration of a service could result in problems sending or receiving email messages.

To create a new service

1. Open PGP Desktop and click the PGP Messaging Control box. The PGP Messaging Control box highlights.
2. Click **New Messaging Service** in the PGP Messaging Control box. You can also select **Messaging > Create New Service.**

   In the PGP Messaging Work area, "New Service" is displayed at the top of the screen, the account properties appear with no values, and the default security policies appear in the Security Policies section.
3. In the **Description** field of the Account Properties section, specify a name for this service.
4. Type your email address in the **Email Address** field.
5. Type the name of your incoming and outgoing email servers, or click **Server Settings** if you want to set advanced options. If you chose to set advanced options, the Server Settings dialog box is displayed.
6. Select the type of server that the new service will be using under **Server Type**:
   - **Internet Mail**—for standalone PGP Desktop users who have a POP or IMAP mail connections.
   - **PGP Universal**—for PGP Desktop users who are in a PGP Universal Server-managed environment. Contact your PGP Universal Server administrator for more details on correct settings.
   - **MAPI/Exchange**—for PGP Desktop users who are using Microsoft Outlook as a client on a Microsoft Exchange/MAPI server. Contact your mail administrator for more information on correct settings.
   - **Lotus Notes**—for PGP Desktop users who are using Lotus Notes as their email client with a Lotus Domino server. For more information on the correct settings, contact your email administrator.

   Some of the fields in the Server Settings dialog box change depending on what type of server you select.

Note: If you are manually connecting to a PGP Universal Server, see *Manually binding to a PGP Universal Server* (on page 311).

7 Enter the following for **Incoming Mail Server**:

- **Name**: Type the name of the mail server that handles incoming messages.
- **Protocol**: Select the protocol used to pick up messages on the incoming mail server.

  The **Automatic** setting (available with the **Internet Mail** or **PGP Universal Server** settings) can automatically detect either POP or IMAP connections.
- **Port**: Keep Automatic (the default) or specify a port to connect to on the incoming mail server to pick up messages (if you have selected either the **Internet Mail** or **PGP Universal Server** settings and either **POP** or **IMAP**—not **Automatic**).
- **SSL/TLS**: Specify how PGP Desktop interacts with your mail server. Choose one:
  - **Automatic:** PGP will do its best to provide SSL/TLS protection. It first tries the alternate port, then it attempts STARTTLS (if supported by the server), finally, if the above fails, it connects to the server unprotected.
  - **Require STARTTLS:** PGP Desktop requires that the server honor the STARTTLS command.
  - **Require SSL:** PGP Desktop requires that the server honor SSL-protected connections on the specified alternate port.
  - **Do Not Attempt:** PGP Desktop does not attempt any SSL/TLS protection of the connection with the mail server.
- **Warn if email client attempts SSL/TLS:** When selected, PGP Desktop displays a warning dialog box if the email client attempts SSL/TLS, as this is a condition that is incompatible with PGP Desktop proxying your email. (This option is selected by default.)

Caution: This option should only be enabled if you are certain your mail server supports SSL. It ensures that PGP Desktop will not fall back to sending or receiving messages with the mail server over an unprotected connection if, for example, a problem occurs while negotiating SSL protection for the connection. **If you enable this option and your mail server does not support SSL, PGP Desktop will not send or receive any of your messages.**

Outgoing Mail Server (SMTP)

- **Name**: Type the name of the mail server that handles outgoing messages.
- **Port**: Keep **Automatic (465, 25)** or specify another port to connect to on the outgoing mail server to send messages.

This option is only available for the outgoing mail server if your settings permitted choosing it for the incoming mail server.

- **SSL/TLS**: Specify how PGP Desktop interacts with your mail server. Choose one:
  - **Automatic:** PGP Desktop will do its best to provide SSL/TLS protection. It first tries the alternate port, then it attempts STARTTLS (if supported by the server), finally, if the above fails, it connects to the server unprotected.
  - **Require STARTTLS:** PGP Desktop requires that the server honor the STARTTLS command.
  - **Require SSL:** PGP Desktop requires that the server honor SSL-protected connections on the specified alternate port.
  - **Do Not Attempt:** PGP Desktop does not attempt any SSL/TLS protection of the connection with the mail server.
- **Warn if email client attempts SSL/TLS:** When selected, PGP Desktop displays a warning dialog box if the email client attempts SSL/TLS, as this is a condition that is incompatible with PGP Desktop proxying your email. (This option is selected by default.)

Caution: This option should only be enabled if you are certain your mail server supports SSL. It ensures that PGP Desktop will not fall back to sending or receiving messages with the mail server over an unprotected connection if, for example, a problem occurs while negotiating SSL protection for the connection. **If you enable this option and your mail server does not support SSL, PGP Desktop will not send or receive any of your messages.**

8. Click **OK** when you are finished.
9. In the **Universal Server** field, select the name of the PGP Universal Server protecting the email domain you are in. **<None>** is displayed if you are not in an email domain protected by a PGP Universal Server. If your domain is protected by a PGP Universal Server, but it is not listed, select **<create new>** to enter the name of your PGP Universal Server. For more information, check with your PGP Universal Server administrator.
10. Click **Key Mode**. The Key Management Mode dialog box is displayed, displaying your current key mode. If necessary, click **Reset Key**, which starts the Key Setup Assistant.
11. Click **OK**.
12. In the **Username** field, type the user name on the email account.
13. In the **Default Key** field, the current key displays.
    - If you are using PGP Desktop as a standalone product, you can either keep the default key, or select another one from the menu (if another key is available).

- If you are using PGP Desktop in a PGP Universal Server-managed environment, the default key is displayed and you cannot change it. If you need to change your key, you must click Key Mode and go through the procedure to reset your key on the PGP Universal Server.

14 Enable **Cache this key's passphrase when I log in** (by selecting the checkbox) if you want to cache the passphrase for the keypair you just selected when you log in.

If you don't cache the key's passphrase, you will be prompted for it when you are sending signed messages or receiving encrypted messages.

15 In the **Security Policies provided by [server name]** section, the current policies that apply to you are displayed. You can keep the default security polices, disable the default security policies, or add new policies if you are using PGP Desktop as a standalone product. If you are using PGP Desktop in a PGP Universal Server-managed environment, your options are likely to be different, depending on what your PGP Universal Server administrator has specified.

16 If you have edited any policies, you must click **Done** when you are finished. Otherwise, when you are done with the security policies, the account is ready. It is not necessary to click a button to save your information. It was saved as soon as you typed it.

Editing Messaging Service Properties

Caution: Before making any changes to an existing messaging service, be sure to exit your email client.

To make changes to the account properties of an existing service

1 Open PGP Desktop and click the PGP Messaging Control box. The PGP Messaging Control box highlights.

2 Click on the name of the service whose account properties you want to edit. The settings for the selected service appear in the PGP Messaging Work area.

3 Make the desired changes to the account properties of the service. For more information, see *Creating a New Messaging Service* (on page 94).

Disabling or Enabling a Service

If you want to stop a service from working, but you don't want to delete the service because you might need it again, you can disable the service. This is useful if you only want PGP Desktop to process mail on particular accounts, but not others. If you are certain that you won't need the service again, you can delete the service.

To disable or enable an existing service

1. In the PGP Messaging Control box, click the name of the service you want to disable. The settings for the service appear in the PGP Messaging Work area.
2. Do one of the following:
   - To disable the service, select **Messaging > Disable Service**. The service is disabled.
   - To enable the service select **Messaging > Enable Service**. The service is enabled.

   PGP Desktop alerts you that the change may not take place until you restart your email client.

Tip: You can disable, enable, and delete services by right-clicking the name in the PGP Messaging Control Box and selecting the desired command.

Deleting a Service

If you are certain that you will not need a messaging service any longer, you can delete the service from PGP Desktop.

To delete a service

1. Click the name of the service you want to delete. The settings for the service appear in the PGP Messaging Work area.
2. Select **Messaging > Delete Service**. The service is deleted.

Tip: You can delete a service by right-clicking the name in the PGP Messaging Control Box and selecting the desired command.

Multiple Services

Some email services and Internet Service Providers use multiple mail servers for a single DNS name in a round-robin fashion such that PGP Desktop may create multiple messaging services for a single email account, seeing each mail server as separate and thus requiring its own messaging service.

PGP Desktop ships with wildcard support for common email services, such as *.yahoo.com and *.me.com (or *.mac.com). However, if you are using a less-common email service or if the services change their mail server configurations, you could run into this problem.

If you see PGP Desktop create multiple services for a single email account, and you check the settings and see they are the same except the mail server for the first service is `mail1.example.com`, the mail server for the second service is `mail2.example.com`, and the mail server for the third is `mail3.example.com`, and so on, you may need to manually edit one of the services.

The best solution is to manually edit one of the services such that the mail server entry for that service can support multiple mail servers being used round-robin. For the example cited above, you could manually change the server name on the Server Settings dialog box for one of the services to `mail*.example.com`, and then delete the other services.

Some round-robin setups may be more complicated, requiring a slightly different solution. For example, if PGP Desktop were to create services with mail servers of pop.frodo.example.com, smtp.bilbo.example.com, and mail.example.com, then the best wildcard solution would be *.example.com.

Troubleshooting PGP Messaging Services

By default, PGP Desktop automatically determines your email account settings and creates a PGP Messaging service that proxies messaging for that email account.

Because of the large number of possible email account settings and mail server configurations, on some occasions a messaging service that PGP Desktop automatically creates may not work quite right.

If PGP Desktop has created a messaging service that is not working right for you, one or more of the following items may help correct the problem:

- Verify that you can both connect to the Internet and send and receive email with PGP Services stopped. To do this:
  - On Windows systems, right-click the PGP Desktop tray icon and select **Stop PGP Services** from the list of commands.
  - On Mac OS X systems, hold down the Option key and select **Quit** from the PGP Desktop icon in the Menu bar.

Note: You should always restart your email client after starting or stopping PGP Services.

- Read the PGP Desktop Release Notes for the version of PGP Desktop you are using to see if your problem is a known issue.
- Make sure SMTP authentication is enabled for the email account (in your email client). This is recommended for PGP Desktop to proxy your messaging. If you only have one email account and you are not using PGP Desktop in a PGP Universal Server-managed environment, then SMTP authentication is not needed. It *is* required when using a PGP Universal Server as your SMTP server, or when you have multiple email accounts on the same SMTP server.
- Open the PGP Log to see if the entries offer any clues as to what the problem might be.
- If SSL/TLS is enabled in your email client, you must disable it there if you want PGP Desktop to proxy your messaging. (This does *not* leave the connection to and from your mail server unprotected; by default PGP Desktop automatically attempts to upgrade any unprotected connection to SSL/TLS protection. The mail server must support SSL/TLS for the connection to be protected.)
- If either **Require STARTTLS** or **Require SSL** is selected (in the SSL/TLS settings of the Server Settings dialog box) your mail server *must* support SSL/TLS or PGP Desktop will not send or receive any messages.
- If your email account uses non-standard port numbers, make sure these are included in the settings of your messaging service.
- If PGP Desktop is creating multiple messaging services for one email account, use a wild card for your mail server name. For more information, see *Multiple Services* (on page 99).
- Delete the PGP Messaging service that is not working correctly and send/receive email. PGP Desktop regenerates the messaging service.

If none of these items help correct the problem, try the following:

1. Delete the PGP Messaging service that is not working correctly.
2. Stop all PGP Desktop services and then exit PGP Desktop if it was open. To stop the services:
   - On Windows systems, right-click the PGP Desktop tray icon and select **Exit PGP Services** from the list of commands.
   - On Mac OS X systems, hold down the Option key and elect **Quit** from the PGP Desktop icon in the Menu bar.
3. Verify that you have Internet connectivity and can send and receive email with PGP Messaging services stopped.
4. Open your email client and write down your email account settings (including user name, email address, incoming and outgoing mail server, incoming mail server protocol, and any non-standard mail server ports).

5 Close your email client and restart PGP Desktop, which restarts PGP services:

- On Windows systems, either restart your computer or open PGP Desktop from the Windows Start menu.
- On Mac OS X systems, either restart your computer or open PGP Desktop.

6 Manually create a PGP Messaging service using the account settings you wrote down.

7 Open your email client and begin sending and receiving messages.

8 If you continue to have problems with a PGP Messaging service, access any of the following for assistance:

- *PGP Corporation website* (http://www.pgp.com)
- *PGP Support website* (https://support.pgp.com)
- *PGP Support forums* (http://forum.pgp.com)

Creating a New Security Policy

Security policies control how PGP Desktop handles outgoing email messages.

Note: When you create a new security policy, you are creating a messaging security policy, not a mailing list policy. You cannot create a new mailing list policy, but you can edit the default mailing list policies.

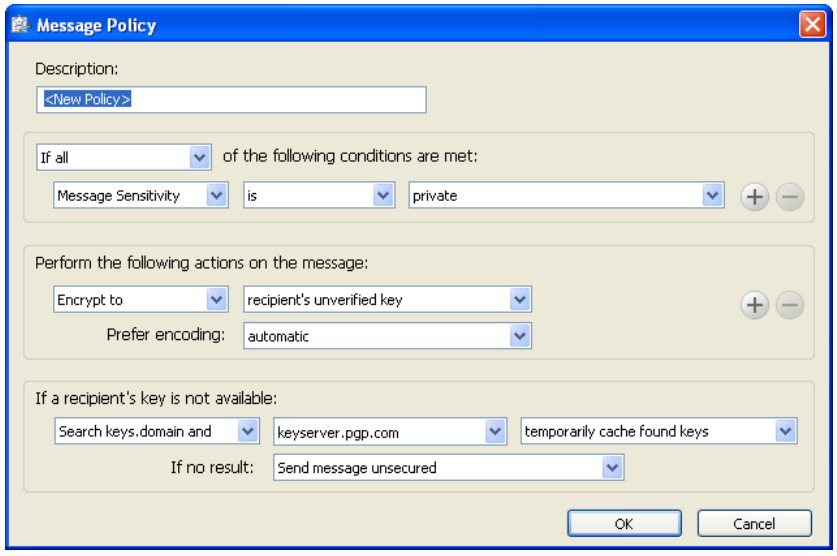
To create a new security policy

1 In the PGP Messaging Control box, click the name of the service for which you want to create a new security policy. The settings for the service appear in the PGP Messaging Work area, including the list of existing security policies.

2 Do one of the following:

- Click **New Policy** in the PGP Messaging Control box.

- Select **Messaging > New Messaging Policy**. The Message Policy dialog box is displayed.



If your email domain is protected by a PGP Universal Server, and you look at the Message Policy settings for a policy from a PGP Universal Server, the fields may be different from the fields shown above.

3 In the **Description** field, type a descriptive name for the policy you are creating.

4 In the First Section (stating the policy conditions), in the **If** field, select:

- **If any**. The policy applies when any condition is met.
- **If all**. The policy only applies when all conditions are met.
- **If none**. The policy only applies if none of the conditions are met.

5 In the first condition field, select:

- **Recipient**. The policy applies only to messages to the specified recipient.
- **Recipient Domain**. The policy applies only to email messages in the specified recipient domain.
- **Sender.** The policy applies only to messages with the specified sender address.
- **Message.** The policy applies only to messages which have the specified signed and/or encrypted state.
- **Message Subject**. The policy applies only to messages with the specified message subject.

- **Message Header**. The policy applies only to messages for which the specified header meets the specified criterion. Note that the conditions described in the next section (is, is not, contains, and so on) apply to the text typed in the text box that is displayed when you select **Message Header**.

Note: When searching message headers in MAPI email systems, you can search on the Subject, Sensitivity, Priority, and Importance headers only.

- **Message Body**. The policy applies only to messages with the specified message body.
- **Message Size.** The policy applies only to messages of the specified size (in bytes).
- **Message Priority**. The policy applies only to messages with the specified message priority.
- **Message Sensitivity**. The policy applies only to messages with the specified message sensitivity.

6 In the second condition field, select:

- **is**. The condition is met when text in the first condition field *matches* the text typed in the text box.
- **is not**. The condition is met when text in the first condition field *does not match* the text typed in the text box.
- **contains**. The condition is met when text in the first condition field *contains* the text typed in the text box.
- **does not contain**. The condition is met when text in the first condition field *does not contain* the text typed in the text box.
- **begins with**. The condition is met when text in the first condition field *begins with* the text typed in the text box.
- **ends with**. The condition is met when text in the first condition field *ends with* the text typed in the text box.
- **matches pattern**. The condition is met when text in the first condition field *matches the pattern* typed in the text box.
- **greater than**. The condition is met when message size is *greater than* the text typed in the text box.
- **less than.** The condition is met when message size is *less than* the text typed in the text box.

7 In the third condition field, select:

- **text entry box**. Type text for the matching criteria. For example, if you selected **Message Size** is **greater than**, then type a number representing the size of the message.
- **normal**. Matching criteria for Message Sensitivity is *normal*.

- **none** or **normal**. Matching criteria for Message Sensitivity is *none* (for Mac OS X systems) or *normal* (for Windows systems).
- **personal**. Matching criteria for Message Sensitivity is *personal*.
- **private**. Matching criteria for Message Sensitivity is *private*.
- **confidential**. Matching criteria for Message Sensitivity is *confidential*.
- **signed**. Matching criteria for Message is signed.
- **encrypted**. Matching criteria for Message is encrypted.
- **encrypted to key ID**. Matching criteria for encrypted to key ID (you must then type a key ID in the resulting text box).
- **low**. Matching criteria for Message Priority is *low*.
- **normal**. Matching criteria for Message Priority is *normal*.
- **high**. Matching criteria for Message Priority is *high*.

Create more condition lines by clicking the plus sign icon.

8 In the **Perform the following actions on the message** section, in the first action field, select:

- **Send In Clear**. Specifies that the message should be sent in the clear; that is, not signed nor encrypted.
- **Sign**. Specifies that the message should be signed.
- **Encrypt to**. Specifies that the message should be encrypted.

9 In the second action field, select:

- **recipient's verified key**. Ensures the message can be encrypted only to a verified key of the intended recipient.
- **recipient's unverified key**. Allows the message to be encrypted to an unverified key of the intended recipient. Will also encrypt to a verified key, if available.
- **recipient's verified end-to-end key**. Ensures the message can be encrypted only to a verified end-to-end key of the intended recipient. An end-to-end key is a key in sole possession of the individual recipient. In a PGP Universal Server-managed environment, this is a Client Key Mode key which is different from a Server Key Mode key, where the PGP Universal Server is in possession of the key.

  Whether the key is end-to-end or not is shown in the **Group** field on the Key Properties dialog box on Windows systems or the Key Info dialog box on Mac OS X systems. **No** means that the key *is* end-to-end (is not part of a group), and **Yes** means that it *is not* end-to-end.)
- **recipient's unverified end-to-end key**. Allows the message to be encrypted to an unverified end-to-end key of the intended recipient. Will also encrypt to a verified key, if available.
- **a list of keys**. Specifies that the message can only be encrypted to keys on the list.

Create more action lines by clicking the plus sign icon.

10 In the prefer message encoding field, select:

- **automatic**. Lets PGP Desktop choose the message encoding format. This is almost always the best option unless you know exactly why you need to use one of the other message encoding formats explicitly.
- **PGP Partitioned**. Sets PGP Partitioned as the preferred message encoding format. This format is the most backwards compatible with older PGP and OpenPGP products.
- **PGP/MIME**. Sets PGP/MIME as the preferred message encoding format. PGP/MIME is able to encrypt and sign the entire message including attachments in one pass and is usually therefore faster and better able to reproduce the full message fidelity.
- **S/MIME**. Sets S/MIME as the preferred message encoding format. Choose S/MIME if, for some reason, you need to force messages to be S/MIME even if the user has a PGP key.

11 In the **Recipient's key is not available** section (or in the **If a Recipient key cannot be found** section on Mac OS X systems), in the first **Key Not Found** field, select:

- **Search keys.domain and.** Specifies a search that includes both keys.domain as well as another server you specify.
- **Search**. Allows for searching for an appropriate key if one is not found on the local keyring.
- **Clear-sign message.** Specifies that the message should be sent in the clear, but signed.
- **Send message unsecured.** Specifies that the message be sent in the clear.
- **Block message**. Specifies that the message must not be sent if an appropriate key is not found.

12 In the second Key Not Found field, select:

- **All keyservers**. Allows all keyservers, including the PGP Global Directory, to be searched for an appropriate key.
- **PGP Global Directory or keyserver.pgp.com**. Specifies that only the PGP Global Directory is searched.
- **[configured keyservers]**. Specifies that only the keyserver you choose from the list of currently configured keyservers is searched. Note that keyservers other than the PGP Global Directory may provide unverified keys that cannot be used if you require verified keys in the policy. Unless you know exactly why you need to search another keyserver and are prepared to find those keys manually to verify them when necessary, search only on the PGP Global Directory. This option is available only on Windows systems.

- **Edit Keyserver List**. Lets you add keyservers to the list of currently configured keyservers. This option is available only on Windows systems.

13 In the last Key Not Found field, specify:

- **temporarily cache found keys**. Specifies that a found key should be temporarily saved in memory. Keys in this cache will automatically be used when verifying signed messages, and will be used for encryption if they have been verified.
- **ask to save found keys**. Specifies that PGP Desktop should ask if you want to save to your local keyring a particular found key.
- **save found keys**. Specifies that found keys should automatically be saved to your local keyring.

14 In the If no result field, select:

- **Clear-sign message.** Allows messages for which an encryption key has not been found to be signed and sent in the clear.
- **Send message unsecured.** Do not encrypt message.
- **Block message.** Prevents message for which an encryption key has not been found from being sent.

15 Click **OK** when the policy settings are configured. The new policy is displayed in the list of security policies.

16

Regular Expressions in Policies

PGP Desktop supports the use of regular expressions in security policies in text entry boxes. Using regular expressions lets you match multiple text strings using a single text string.

Note: In addition to the following examples, PGP Desktop also supports broader regular expressions that adhere to standard formats. The "Matches Pattern" criteria actually means "matches regular expression."

Some mail policy rule conditions require that some part of an email must match a pattern. The patterns in the condition take the form of a regular expression. A regular expression is a string of characters that represents the format for a term to match. Any term that fits the format of the regular expression is a match.

Some common elements of regular expressions:

?	indicates that there should be one or none of the previous expression
+	indicates that there is at least one of the previous expression
.	matches any single character

*	indicates that there should be none, one, or any number of the previous expression
[ ]	matches any single character contained within the brackets
[a-z]	matches any lowercase letter within the set from a to z
[1-9]	matches any digit within the set from 1 to 9
{n}	a sequence of exactly n matches of the expression

The following are examples of regular expressions to match common items that may appear in a sensitive email message.

Data	Example	Regular Expression
Phone number	(555)555-4567	\(?[2-9][0-9]{2}[\]-.)[2-9][0-9]{2}[-.][0-9]{4}
Email address	joe@example.com	[a-zA-Z0-9._%-]+@[a-zA-Z0-9.-]+\.[a-zA-Z]{2,6}
Credit card number	1234 1234 1234 1234	[1-9][0-9]{3} ?[0-9]{4} ?[0-9]{4} ?[0-9]{4}
Social Security Number	123-45-6789	[0-9]{3}-[0-9]{2}-[0-9]{4}
City, state abbreviation	Palo Alto, CA	.*, [A-Z][A-Z]
2-character state abbreviation	CA	[A-Z][A-Z]
Zip code	12345	[0-9]{5}(-[0-9]{4})?
Dollar amounts, with leading $ symbol	$3.95	\$[0-9]+.[0-9][0-9]
Date, numeric	2003-08-06	[0-9]{4}-[0-9]{2}-[0-9]{2}
Date, alpha-numeric	Jan 3, 2003	(Jan|Feb|Mar|Apr|May|Jun|Jul|Aug|Sep|Oct|Nov|Dec)\.?(3[0-1]|[1-2][0-9]|0?[0-9]), [0-9]{4}
HTTP URL	http://www.example.com	https?://(([012][0-9]{0,2}\.){3}[012][0-9]{0,2}|([a-zA-Z0-9]+\.)+[a-zA-Z0-9]{2,6})(/.*)?
IP address	123.123.123.123	([012][0-9]{0,2}\.){3}[012][0-9]{0,2}
A blank line		^$

Security Policy Information and Examples

When you create a service, several default security policies are automatically created:

- Require Encryption: [PGP] Confidential
- Sign + Encrypt Button*
- Sign Button*
- Encrypt Button*
- Mailing List Admin Requests
- Mailing List Submissions
- Opportunistic Encryption.

** These policies are available only on PGP Desktop for Windows.*

The order of the default policy rules is important. Be sure the order appears exactly as described above.

This section describes how the default security policies work. It also describes two example situations for which you might want to create a security policy and explains how to configure them.

Note: If you make any changes to the default policies and want to restore the default settings, click **Revert to Default** (for Windows systems) or **Revert** (for Mac OS X systems) in the Message Policy dialog box.

Encrypt Button Default Policy

Encrypt Button is one of the default security policies that PGP Desktop automatically creates for a service. The settings for this default policy are:

- If: If all
- Conditions: Message Header "X-PGP-Encrypt-Button" contains "selected"
- Actions: Encrypt to recipient's verified key
- Prefer encoding: automatic
- If a recipient's key is not available: Search keys.domain and keyserver.pgp.com and temporarily cache found keys
- If no result: Block message

This rule should appear fourth in the list of default policies.

Note: If you have upgraded from PGP Desktop for Windows version 9.x, this policy is not automatically included and you will need to create the policy manually with the settings described above. For information on how to create a new policy, see *Creating a New Security Policy* (on page 101). If you do not plan to use the Encrypt button with Microsoft Outlook, you do not need to create this policy.

Mailing List Admin Requests Default Policy

Mailing List Admin Requests is one of the default security policies that PGP Desktop automatically creates for a service.

The settings for this default policy are:

- If: If any
- Conditions: Recipient / matches pattern/ .*-subscribe@.*, .*-unsubscribe@.*, .*-report@.*, .*-request@.*, .*-bounce@.*,
- Actions: Send in clear

This rule should appear fifth in the list of default policies.

Mailing List Submission Default Policy

Mailing List Submission is one of the default security policies that PGP Desktop automatically creates for a service.

The settings for this default policy are:

- If: If any
- Conditions: Recipient / matches pattern/ .*-users@.*, .*-bugs@.*, .*-docs@.*, .*-help@.*, .*-news@.*, .*-digest@.*, .*-list@.*, .*-devel@.*, .*-announce@.*,
- Actions: Sign

Prefer Encoding: PGP Partitioned This rule should appear sixth in the list of default policies.

Opportunistic Encryption Default Policy

Opportunistic Encryption is one of the default security policies that PGP Desktop automatically creates for a service. The settings for this default policy are:

- If: any
- Conditions: Recipient Domain / is / *
- Actions: Sign / Encrypt to / recipient's verified key
- Prefer message encoding: automatic

- Key Not Found: Search keys.domain and / keyserver.pgp.com/ temporarily cache found keys

If no result: Send message unsecured This rule should appear seventh (last) in the list of default policies. Opportunistic Encryption causes those messages for which a verified key can be found to be sent signed and encrypted. Those messages for which a verified key cannot be found are delivered with no encryption (in the clear). This ensures your messages get sent, although some may be sent in the clear.

This policy was designed to go last in your list of security policies, as it will match any message sent. If placed above a policy in the list, PGP Desktop will never reach that policy, thus rendering it useless.

Require Encryption: [PGP] Confidential Default Policy

Require Encryption: [PGP] Confidential is one of the default security policies that PGP Desktop automatically creates for a service. The settings for this default policy are:

- If: any
- Conditions: Message Subject / contains / [PGP]
  Message Sensitivity / is / confidential
- Actions: Sign / Encrypt to / recipient's verified key
- Prefer message encoding: automatic
- Key Not Found: Search keys.domain and / All Keyservers / temporarily cache found keys
- If no result: Block message

This rule should appear first in the list of policies.

Require Encryption: [PGP] Confidential causes those messages with subjects that contain [PGP] or are marked confidential in your email client to require encryption to a verified key in order to be sent. If a verified key cannot be found, the message is *not* sent.

Sign + Encrypt Buttons Default Policy

Encrypt and Sign Buttons is one of the default security policies that PGP Desktop automatically creates for a service. The settings for this default policy are:

- If: If all
- Conditions: Message Header "X-PGP-Sign-Button" contains "selected"; Message Header "X-PGP-Encrypt-Button" contains "selected"
- Actions: Sign; Encrypt to recipient's verified key
- Prefer encoding: automatic

- If a recipient's key is not available: Search keys.domain and keyserver.pgp.com and temporarily cache found keys
- If no result: Block message

This rule should appear second in the list of default policies.

Note: If you have upgraded from PGP Desktop for Windows version 9.x, this policy is not automatically included and you will need to create the policy manually with the settings described above. For information on how to create a new policy, see *Creating a New Security Policy* (on page 101). If you do not plan to use the Encrypt button with Microsoft Outlook, you do not need to create this policy.

Sign Button Default Policy

Sign Button is one of the default security policies that PGP Desktop automatically creates for a service. The settings for this default policy are:

- If: If all
- Conditions: Message Header "X-PGP-Sign-Button" contains "selected"
- Actions: Sign
- Prefer encoding: automatic

This rule should appear third in the list of default policies.

Note: If you have upgraded from PGP Desktop for Windows version 9.x, this policy is not automatically included and you will need to create the policy manually with the settings described above. For information on how to create a new policy, see *Creating a New Security Policy* (on page 101). If you do not plan to use the Encrypt button with Microsoft Outlook, you do not need to create this policy.

Example of a Policy to Require Encryption to <Domain>

If you use Opportunistic Encryption with its default settings and you put it at the bottom of the list of policies, it will cause those messages for which a verified key cannot be found to be delivered in the clear. This ensures that your messages get sent, but it also means that some may be sent in the clear.

If there are specific domains to which sending in the clear is not an option, you can create a security policy that calls for encrypting and/or signing or the message is *not* sent. When you create this policy, make sure it is higher in the list than Opportunistic Encryption.

- If: any
- Conditions: Recipient Domain / is / example.com
- Actions: Encrypt to / recipient’s verified key

- Prefer message encoding: automatic
- Key Not Found: Search keys.domain and / All Keyservers / temporarily cache found keys
- If no result: Block message

This security policy is similar to Require Encryption: [PGP] Confidential in that it requires a message be encrypted or the message is not sent, but the criteria is not whether the message is marked confidential but rather that the email domain of the recipient is example.com. Using this policy ensures all messages to example.com are encrypted with a verified key or they are not sent.

Example of a Policy to Sign and Send in the Clear to a Specific Domain

If you regularly send email to a domain for which you want to sign all messages but not encrypt them, you should set up a policy for that domain.

- If: any
- Conditions: Recipient Domain / is / example.com
- Actions: Sign
- Prefer message encoding: automatic

Working with the Security Policy List

There are several important things you can do to the security policies in the list of security policies, such as edit a policy, add a new policy (described in *Creating a New Security Policy* (on page 101)), delete a policy, and change the order of policies in the list.

Editing a Security Policy

To edit an existing security policy

1. Open PGP Desktop and click the PGP Messaging Control box. The PGP Messaging Control box highlights.
2. In the PGP Messaging Control box, click the name of the service that has the security policy you want to edit. The properties for the service you selected appear in the PGP Messaging Work area.
3. Click **Edit Policies**.
4. Select the security policy you want to edit, then do one of the following:

- To edit the policy, click **Edit Policy**. The Message Policy dialog box is displayed, displaying the current settings for the specified policy. Make the desired changes to the policy. For information about the fields on the Message Policy dialog box, see *Creating a New Security Policy* (on page 101). When you have made the desired changes, click **OK** to close the Message Policy dialog box. The specified security policy is changed.
- To delete the policy, click **Remove Policy**.
- To create a copy of the policy (to use as a basis for a new policy), click **Duplicate Policy**.
- To move the policy up or down in the list (changing the order in which policies are applied), click **Move Up** or **Move Down**.

Default policies can be viewed, modified, and disabled, but not deleted.

5 Click **Done**.

Editing a Mailing List Policy

To edit a default Mailing List policy

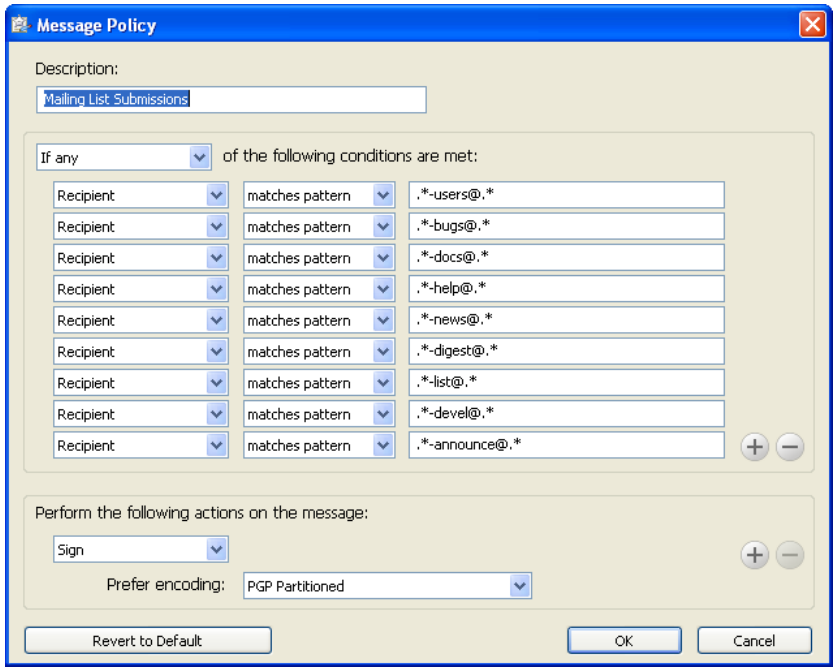
1 Open PGP Desktop and click the PGP Messaging Control box. The PGP Messaging Control box highlights.

2 In the PGP Messaging Control box, click the name of the service that has the security policy you want to edit. The properties for the service you selected appear in the PGP Messaging Work area.

3 Click the **Edit Policies** button.

4 In the list of security policies, click on the Mailing List policy you want to edit. The selected policy highlights.

5 Click **Edit Policy**. The Message Policy dialog box is displayed, displaying the current settings for the specified policy.



The default policies can be viewed, modified, and disabled, but not deleted.

6 Make the desired changes to the policy. In the first field, select:

- **If any**. The policy applies when any condition is met.
- **If all**. The policy only applies when all conditions are met.
- **If none**. The policy only applies if none of the conditions are met.

7 In the first condition field, select:

- **Recipient**. The policy applies only to messages to the specified recipient.
- **Recipient Domain**. The policy applies only to email messages in the specified recipient domain.
- **Sender.** The policy applies only to messages with the specified sender address.
- **Message.** The policy applies only to messages which have the specified signed and/or encrypted state.
- **Message Subject**. The policy applies only to messages with the specified message subject.
- **Message Header**. The policy applies only to messages for which the specified header meets the specified criterion. Note that the conditions described in the next section (is, is not, contains, and so on) apply to the text typed in the text box that is displayed when you select **Message Header**.

Note: Searching message headers in Lotus Notes and MAPI email systems is not implemented, as messages in these systems do not include headers.

- **Message Body**. The policy applies only to messages with the specified message body.
- **Message Size.** The policy applies only to messages of the specified size (in bytes).
- **Message Priority**. The policy applies only to messages with the specified message priority.
- **Message Sensitivity**. The policy applies only to messages with the specified message sensitivity.

8 In the second condition field, select:

- **is**. The condition is met when text in the first condition field *matches* the text typed in the text box.
- **is not**. The condition is met when text in the first condition field *does not match* the text typed in the text box.
- **contains**. The condition is met when text in the first condition field *contains* the text typed in the text box.
- **does not contain**. The condition is met when text in the first condition field *does not contain* the text typed in the text box.
- **begins with**. The condition is met when text in the first condition field *begins with* the text typed in the text box.
- **ends with**. The condition is met when text in the first condition field *ends with* the text typed in the text box.
- **matches pattern**. The condition is met when text in the first condition field *matches the pattern* typed in the text box.

9 In the third condition field, in the text entry box, type the text for the matching criteria.

10 In the Perform the following actions on the message section, in the first action field, select:

- **Send In Clear**. Specifies that the message should be sent in the clear; that is, not signed nor encrypted.
- **Sign**. Specifies that the message should be signed.
- **Encrypt to**. Specifies that the message should be encrypted.

11 In the second action field, select:

- **recipient's verified key**. Ensures the message can be encrypted only to a verified key of the intended recipient.
- **recipient's unverified key**. Allows the message to be encrypted to an unverified key of the intended recipient.

recipient's verified end-to-end key. Ensures the message can be encrypted only to a verified end-to-end key of the intended recipient. An end-to-end key is a key in sole possession of the individual recipient. In a PGP Universal-managed environment, this is a Client Key Mode key which is different from a Server Key Mode key, where the PGP Universal Server is in possession of the key.

Whether the key is end-to-end or not is shown in the **Group** field on the Key Properties dialog box on Windows systems or the Key Info dialog box on Mac OS X systems. **No** means that the key *is* end-to-end (is not part of a group), and **Yes** means that it *is not* end-to-end.)

- **recipient's unverified end-to-end key**. Allows the message to be encrypted to an unverified end-to-end key of the intended recipient.
- **a list of keys**. Specifies that the message can only be encrypted to keys on the list.

12 In the prefer message encoding field, select:

- **automatic**. Lets PGP Desktop choose the message encoding format. This is almost always the best option unless you know exactly why you need to use one of the other message encoding formats explicitly.
- **PGP Partitioned**. Sets PGP Partitioned as the preferred message encoding format. This format is the most backwards compatible with older PGP and OpenPGP products.
- **PGP/MIME**. Sets PGP/MIME as the preferred message encoding format. PGP/MIME is able to encrypt and sign the entire message including attachments in one pass and is usually therefore faster and better able to reproduce the full message fidelity.
- **S/MIME**. Sets S/MIME as the preferred message encoding format. Choose S/MIME if, for some reason, you need to force messages to be S/MIME even if the user has a PGP key.

13 In the **Recipient's key is not available** section, in the first **Key Not Found** field, select:

- **Search keys.domain and**. Specifies a search that includes both keys.domain as well as another server you specify.
- **Search**. Allows for searching for an appropriate key if one is not found on the local keyring.
- **Clear-sign message**. Specifies that the message should be sent in the clear, but signed.
- **Send message unsecured**. Specifies that the message be sent in the clear.
- **Block message**. Specifies that the message must not be sent if an appropriate key is not found.

14 In the second Key Not Found field, select:

- **All keyservers**. Allows all keyservers, including the PGP Global Directory, to be searched for an appropriate key.
- **PGP Global Directory or keyserver.pgp.com**. Specifies that only the PGP Global Directory is searched.
- **[configured keyservers]**. Specifies that only the keyserver you choose from the list of currently configured keyservers is searched. Note that keyservers other than the PGP Global Directory may provide unverified keys that cannot be used if you require verified keys in the policy. Unless you know exactly why you need to search another keyserver and are prepared to find those keys manually to verify them when necessary, search only on the PGP Global Directory. This option is available only on Windows systems.
- **Edit Keyserver List**. Lets you add keyservers to the list of currently configured keyservers. This option is available only on Windows systems.

15 In the last Key Not Found field, specify:

- **temporarily cache found keys**. Specifies that a found key should be temporarily saved in memory. Keys in this cache will automatically be used when verifying signed messages, and will be used for encryption if they have been verified.
- **ask to save found keys**. Specifies that PGP Desktop should ask if you want to save to your local keyring a particular found key.
- **save found keys**. Specifies that found keys should automatically be saved to your local keyring.

16 In the If no result field, select:

- **Clear-sign message**. Allows messages for which an encryption key has not been found to be signed and sent in the clear.
- **Send message unsecured**. Do not encrypt message.
- **Block message**. Prevents message for which an encryption key has not been found from being sent.

17 When you have made the desired changes, click **OK** to close the Message Policy dialog box. The specified security policy is changed.

Deleting a Security Policy

To delete an existing security policy

1 In the PGP Messaging Control box, click the name of the service that has the security policy you want to delete. The properties for the service you selected appear in the PGP Messaging Work area.

2 Click **Edit Policies**.

3 In the list of security policies, click on the policy you want to delete. The specified policy highlights.

4 Click **Remove Policy**. A PGP Desktop Confirmation dialog box is displayed.

5 Click **Delete Policy** to delete the policy or **OK** to disable it. The specified security policy is deleted or disabled.

6 Click **Done**.

Note: Default policies can be disabled, but not deleted.

Changing the Order of Policies in the List

To change the order of policies in the Security Policy list

1 In the PGP Messaging Control box, click on the name of the service that has the security policy whose order you want to change. The properties for the service you selected appear in the PGP Messaging Work area.

2 Click **Edit Policies**.

3 In the list of security policies, click on the policy whose order in the list you want to change. The specified policy highlights.

4 Click **Move Up** or **Move Down** until the policy is in the desired location in the list. Make sure **Opportunistic Encryption** is at the bottom of the list. Any policy below it will not be implemented.

5 Click **Done**.

PGP Desktop and SSL

When you use PGP Desktop, PGP Corporation's goal is for your data to be automatically protected whenever possible. This includes protecting your data in transit between your email client and your mail server.

Tip: SSL stands for Secure Sockets Layer, which is a cryptographic protocol that secures communications between two devices; in this case, between your email client or PGP Desktop and your mail server.

PGP Desktop protects your data to and from your mail server in different ways depending on the circumstances. The following information applies only if you selected **Automatic** (the default) for the SSL/TLS setting in the server settings dialog:

- **When the connection is not SSL protected.** If the connection between your email client and your mail server is not SSL protected, PGP Desktop will automatically attempt to upgrade that connection to SSL (it will negotiate with your mail server and upgrade the connection if the mail server supports it).

  If the mail server does not support SSL, the message(s) PGP Desktop sends and receives during the session will be over an unprotected connection. Whether or not those messages will be encrypted or decrypted by PGP Desktop does not affect the attempt by PGP Desktop to upgrade the connection. Messages encrypted by PGP Desktop can be sent or received over a connection protected by SSL or not protected by SSL.

  Note: PGP Desktop always attempts to upgrade an unprotected connection to the mail server to SSL protection because an SSL-protected connection not only protects any non-PGP-encrypted messages on their way to the mail server or coming from it, but it also protects your mail server authentication passphrase when it is sent to the mail server.

- **When the connection is protected by SSL.** If you have SSL protection turned on in your email client for the connection to your mail server, you must turn it off if you want PGP Desktop to encrypt or decrypt your messages; PGP Desktop cannot process your messages if they are already SSL-encrypted.

  Turning off SSL protection in your email client does not mean that your non-PGP-encrypted messages are now unprotected going to or coming from your mail server. As with any connection that is not SSL protected, PGP Desktop will automatically attempt to upgrade the connection to SSL protection if the mail server supports it (if you selected **Automatic** for the SSL/TLS setting in the server settings dialog). If the mail server does not support SSL connections, the messages PGP Desktop sends during the session will be over an unprotected connection.

  The only time your messages will be sent in the clear to your mail server is if the messages are not PGP encrypted and the connection to the mail server cannot be upgraded to SSL protected, or you have selected the **Do Not Attempt** option in the SSL/TLS setting.

- **When you cannot have messages sent in the clear.** Some security policies require that only protected messages can be sent; in other words, unprotected messages must never be sent. If necessary, you can configure PGP Desktop to support this kind of security policy.

  Select the applicable PGP Messaging service, access the Server Settings dialog box (click the name of the server currently in the Server field of the Account Properties for the service), and choose an option from the SSL/TLS list *other* than **Automatic**.

  When this option is enabled, PGP Desktop will only send messages to or receive messages from your mail server if the connection between them is SSL protected. If an SSL-protected connection cannot be established, PGP Desktop will not interact with the server.

Note: This option should be enabled only if you are certain your mail server supports SSL. It ensures that PGP Desktop will not fall back to sending or receiving messages with the mail server over an unprotected connection if, for example, a problem occurs while negotiating SSL protection for the connection. If you enable this option and your mail server does not support SSL, PGP Desktop will not send or receive any of your messages.

- **When you want SSL enabled in your email client.** To use PGP Desktop with SSL enabled in your email client, you must deselect the option to **Warn if email client attempts SSL/TLS** for your incoming or outgoing mail server, or both. When you disable this option for a connection to a mail server, PGP Desktop ignores incoming and outgoing traffic over that connection when the connection is protected by SSL.

  PGP Desktop monitors the connections to and from this server, ignoring traffic sent or received on SSL-protected connections. If, however, PGP Desktop detects a non-SSL-protected connection, it handles the traffic like any other unprotected connection and attempts to upgrade the connection to SSL (if in Automatic mode) and apply applicable policies to messages.

Key Modes

If you are using PGP Desktop in a PGP Universal Server-managed environment, PGP Desktop will have a key mode.

Note: The information in this section applies *only* to users of PGP Desktop in an email domain protected by a PGP Universal Server.

Available key modes are:

- **Server Key Mode (SKM):** Keys are generated on and managed by the PGP Universal Server; they are only shared with the computer on which you are running PGP Desktop as needed. Your private key is stored only on the PGP Universal Server, which also handles all private key management. The PGP Universal administrator has complete access to your private key and can thus access all messages you encrypt. This key mode is *not* compatible with smart cards (smart cards can be used on Windows systems only).

  Starting with PGP Desktop version 10.0, SKM keys that previously could be used only for messaging can be used for all other PGP Desktop encryption actions. This includes encrypting disks and files, and decrypting MAPI email messages when offline.

  If you are using an SKM key, you will never need to enter a passphrase for authentication. SKM key passphrases are randomly generated by PGP Desktop and are stored encrypted. When PGP Desktop requires a passphrase, PGP Desktop retrieves the encrypted passphrase from your system without requiring interaction from you.

- **Client Key Mode (CKM):** Keys are generated on and managed by the computer on which you are running PGP Desktop; private keys are not shared with the PGP Universal Server. All cryptographic operations (encrypt, decrypt, sign, verify) are also handled by the computer on which you are running PGP Desktop. On Windows systems, this key mode is compatible with smart cards.
- **Guarded Key Mode (GKM):** Very similar to CKM, except that an *encrypted* copy of the private key is stored on the PGP Universal Server, which you can access if you change computers. As the key is encrypted, the PGP Universal administrator cannot access this private key, only you can. This key mode is compatible with smart cards (on Windows systems only) as long as the key is not generated directly on the smart card; that is, as long as the key is copied to the smart card.
- **Server Client Key Mode (SCKM):** Also very similar to CKM, except that a copy of the private *encryption* key is stored on the PGP Universal Server; private *signing* keys never leave the computer on which you are running PGP Desktop. This key mode ensures compliance with laws and corporate policies that require that the private signing key not leave the control of the user, while making sure that the private encryption key is stored in case of emergency. This key mode is compatible with smart cards (on Windows systems only) as long as the key is not generated directly on the smart card. SCKM requires a key with a separate signing subkey, which can be created for a new key with PGP Desktop 9.5 or later or added to an older PGP key using PGP Desktop 9.5 or later.

Depending on how your PGP administrator configured your copy of PGP Desktop, you may or may not be able to choose your key mode. Also, you may or may not be able to change your key mode.

Contact your PGP administrator if you have additional questions about your key mode.

Determining Key Mode

Remember that only PGP Desktop users in a PGP Universal-protected environment will have a key mode; standalone PGP Desktop users do not have a key mode.

To determine your key mode

- Open PGP Desktop and select the PGP Messaging service whose key mode you want to determine. The account properties and security policies for the selected service appear.

  In the **Universal Server** field, the key mode for the selected service is shown in parentheses after the name of the PGP Universal Server (for example, **keys.example.com (GKM)**). This indicates that the key mode for the selected service, in this example, is Guarded Key Mode and that the associated PGP Universal Server is keys.example.com.

Changing Key Mode

Depending on how your PGP administrator configured your copy of PGP Desktop, you may not be able to change your key mode.

To change your key mode

1. Open PGP Desktop and select the PGP Messaging service for the key mode you want to change. The account properties and security policies for the selected service appear.
2. Click **Key Mode**. The PGP Universal Key Mode screen is displayed, describing your current key management mode.
3. Click **Reset Key** and then click **Yes** in the confirmation message displayed. The PGP Key Setup Assistant is displayed.
4. Read the text, then click **Next**. The Key Management Selection screen is displayed.
5. Select the desired key mode. Depending on how your PGP Universal administrator configured your copy of PGP Desktop, some key modes may not be available.
6. Click **Next**. The Key Source Selection screen is displayed.
7. Choose one of the following:
   - **New Key**. You will be prompted to create a new PGP key, which will be used to protect your messaging.
   - **PGP Desktop Key**. You will be prompted to specify an existing PGP key to use to protect your messaging.
   - **Import Key**. You will be prompted to import a PGP key, which will be used to protect your messaging.
8. Make the desired selection, then click **Next**.
9. If you selected **New Key**, do the following:
   - Enter a passphrase for the key, then click **Next**.
   - When the key is generated, click **Next**.
   - Click **Finish**.
10. If you selected **PGP Desktop Key**, do the following:
    - Select the key from the local keyring that you want to use, then click **Next**.
    - Click **Finish**.
11. If you selected **Import Key**, do the following:
    - Browse to file that holds the PGP key you want to import (it must contain a private key), then click **Next**.

- Click **Finish**.

Tip: You can also change your key mode from the PGP Options dialog box. Choose **Tools > PGP Options** and select the Advanced tab. Click **Reset Key**, and follow the steps above when the PGP Key Setup Assistant is displayed. This option is available if you are using PGP Desktop in a PGP Universal Server-managed environment.

Viewing the PGP Log

Use the PGP Log to see what actions PGP Desktop is taking to secure your messages.

To view the PGP Desktop Log

1. To view logs, you must turn on logging. To do this, in PGP Desktop select **Tools > PGP Logging**.
2. In PGP Desktop, click the PGP Messaging control box and then click **PGP Log**. The PGP Log is displayed in the application window.
3. To change the view options or filter on specific logging information, do the following:
   - Click the arrow for **View log for** to select the days of the logs you want to view.
   - Click the arrow for **View topic** to select the types of logs you want to view. Choose from **All**, **PGP**, **Email**, **IM, Whole Disk**, **NetShare**, **Zip/SDA**, or **Virtual Disk**.
   - Click the arrow for **View level** to select the minimum severity of log entries you want to view. Choose from **Error**, **Warn, Info**, or **Verbose**. Note that **Verbose** can result in some large log files.
4. When you are finished viewing the log:
   - To save a copy of the PGP Log, click **Save**.
   - To clear the entries in the PGP Log, click **Shred**.

8 Securing Instant Messaging

This section provides information on how to use PGP Desktop to secure your instant messaging (IM) sessions. For information about the PGP Options that affect IM sessions, see *Messaging Options* (on page 287).

Note: If you are using PGP Desktop in a PGP Universal Server-managed environment, your PGP Universal Server administrator may have disabled certain features. When a feature is disabled, the control item in the left side is not displayed and the menu and other options for that feature are not available. The graphics included in this guide depict the default installation with all features enabled. If your PGP Universal Server administrator has disabled this functionality, this section does not apply to you.

In This Chapter

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Encrypting your IM Sessions 127

About PGP Desktop's Instant Messaging Compatibility

PGP Desktop automatically encrypts AOL and iChat standard instant messaging sessions, direct connects, and file transfers if the following conditions are met:

- Both users in the IM session have PGP Desktop 9.0 or later installed and running on the system on which they are using IM. To confirm that you are using PGP Desktop 9.0 or later, click the PGP Tray icon and select **About PGP** from the shortcut menu (from within the PGP Desktop window, select **Help > About PGP**).
- Both users have the **Encrypt instant messages** setting enabled. To do this:
  - On Windows systems, select **Tools > Options**, click the Messaging tab, and select the checkbox to **Encrypt AOL Instant Messages (AIM)**.
  - On Mac OS X systems, select **PGP > Preferences**, click the Messaging icon, and select the checkbox to **Encrypt AOL Instant Messages (AIM)**.

Tip: On Windows systems, quickly verify that instant messaging encryption is enabled by clicking the PGP Tray icon. There should be a check mark next to **Use PGP AIM Proxy** in the shortcut menu.

- Both users are using compatible IM clients. For information on the compatible IM clients, see the following section.
- The AIM address of the initiator of the IM session is on the Buddy List of the recipient of the session (or the session will not be encrypted).

The secure IM feature is compatible with any IM client that supports AOL's OSCAR protocol for instant messaging, such as AOL Instant Messenger, Trillian Pro, iChat and Gaim.

The file transfer and direct connect sessions require recent versions of these clients in order for PGP Desktop to encrypt them. In addition, PGP Corporation recommends that you set up the connection for both Direct IM/Direct Message and File Transfer to use the AOL Proxy, rather than allowing your buddy to connect directly to your computer.

Notes:

Audio and video connections are not encrypted by PGP Desktop.

PGP Desktop's secure IM feature uses Perfect Forward Secrecy for enhanced security. All keys used to secure your IM sessions are generated at the beginning of the connection and then destroyed when you disconnect; completely new sets of keys are used for every IM session. This adds an extra level of security to your IM sessions.

Instant Messaging Client Compatibility

PGP Desktop is compatible with the following instant messaging clients when encrypting AIM instant messages, file transfers, and direct connections:

- AOL AIM 6.5.5
  - To encrypt instant messages with AIM 6.5, you must change the default port that AIM uses from 493 to 5190.
  - Audio and video connections are not encrypted by PGP Desktop.
  - Continued interoperability with the AIM service may be affected by changes made to the underlying AIM protocols after PGP Desktop version 10.0 is released.
- Trillian 3.1 (Basic and Pro)

Other instant messaging clients may work for basic instant messaging, but have not been certified for use.

About the Keys Used for Encryption

A 1024-bit RSA key is generated each time you log onto your IM software, and is destroyed when you log out. This key is used to exchange randomly generated seed data with anyone with whom you communicate. The seed data is combined and hashed to allow each participant in the communication to generate a set of symmetric keys used for that particular communication (one for each direction). The symmetric keys are used to encrypt all the messages with AES256.

Some of that data is also used to generate keyed-hash message authentication code, or HMAC, for each message so that the message integrity can be checked.

Note: The keys used for secure IM communication are not user configurable.

Encrypting your IM Sessions

Once you have met the conditions described in *About PGP Desktop's Instant Messaging Compatibility* (on page 125), start your IM session as you normally would. Your IM sessions with any other PGP Desktop user using a compatible IM client are automatically and transparently protected.

There are multiple ways to verify that your IM session is being protected:

- When you start an IM session, the PGP Notifier is displayed, informing you that a secured IM session has begun.
- When the IM session begins, the first message you see from the other user in the session will have extra text below it that says: "Conversation encrypted by PGP Desktop."
- A padlock icon shown next to the names in the Buddy List indicates that the users are probably using PGP Desktop to secure their IM sessions.

  Note that the padlock could also mean that the user is using AIM's built-in security.
- If you open the PGP Log after you have started your IM session, it will have an entry noting that the IM session is encrypted, for example:

  ```
  17:01:06 Info    Initiating PGP Desktop encrypted AIM
  session with breynolds using your key with id 0xEFDDCE3C.
  ```

9 Viewing Email with PGP Viewer

This section provides information on how to use PGP Viewer to decrypt, verify, and display encrypted messages.

Note: PGP Viewer only runs on systems with PGP Desktop installed. You cannot use PGP Viewer standalone.

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Opening an Encrypted Email Message or File 130
Copying Email Messages to Your Inbox 132
Exporting Email Messages 132
Specifying Additional Options 132
Specifying Options in PGP Viewer 133
Security Features in PGP Viewer 134

Overview of PGP Viewer

In normal usage, PGP Desktop sits between your email client (Mozilla Thunderbird, for example) and your email server so that PGP Desktop can encrypt and sign outgoing messages and decrypt and verify incoming messages. When PGP Desktop is doing this, it is called "in the mail stream."

Use PGP Viewer to decrypt, verify, and display messages *outside* the mail stream.

There are multiple ways you could have ended up with encrypted messages outside the mail stream:

- **Encrypted messages saved securely.** Many organizations store messages encrypted for security purposes. Storing them puts them outside the mail stream, but PGP Viewer can decrypt, verify, and display them while maintaining the original encrypted message.
- **Encrypted text in a webmail message.** Encrypted messages sent to a webmail account cannot be decrypted by PGP Desktop. However, PGP Viewer can decrypt those messages. Simply open the message.pgp file attachment using PGP Viewer.

- **Encrypted text not decrypted by PGP Desktop.** If a message was automatically downloaded by your email client when PGP Desktop was not running or when your passphrase was not cached, you could end up with encrypted message text that is now outside the mail stream.

PGP Viewer decrypts, verifies, and displays multiple types of messaging content:

- Modern PGP-encrypted content (PGP/MIME and PGP Partitioned)
- Legacy PGP-encrypted content (PGP/MIME and PGP Partitioned)

RFC-2822 compliant encrypted content PGP Viewer uses PGP Desktop keyrings for operations that require keys. PGP Viewer honors applicable PGP Desktop preferences; passphrase caching options, for example.

In a PGP Universal Server-managed environment, PGP Viewer searches for verification keys per the applicable policy.

PGP Viewer displays signature information for messages it decrypts in the message window, not in the message itself. This provides access to full signature information and prevents spoofing of inline signature annotations.

Compatible Email Clients

Use PGP Viewer to copy the text of a decrypted/verified message to the following email clients:

- Windows Mail (Windows)
- Microsoft Outlook (Windows)
- Thunderbird (Windows and Mac OS X)
- Outlook Express (Windows)
- Mail.app (Mac OS X)

Due to the design of Lotus Notes architecture, an encrypted message cannot be dragged from Lotus Notes email client and dropped into PGP Viewer to be decrypted.

Opening an Encrypted Email Message or File

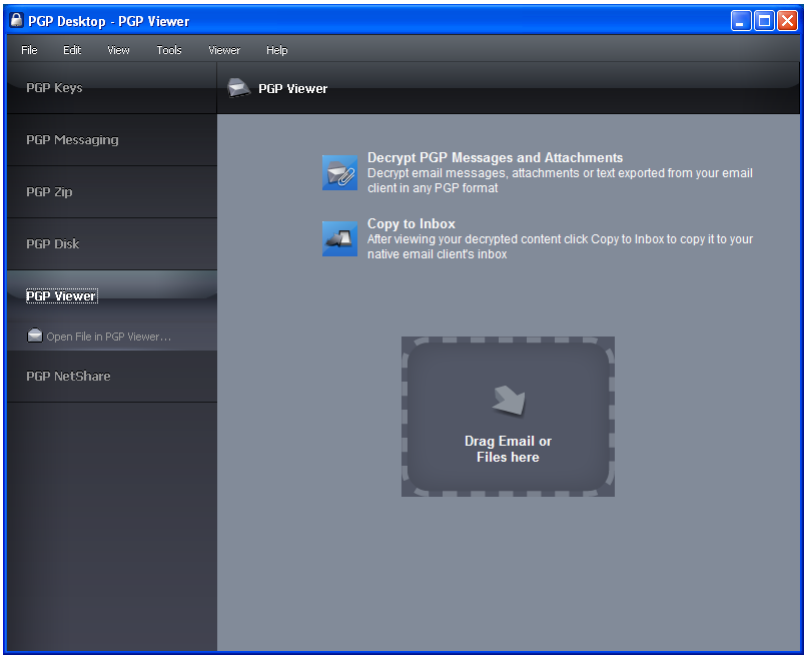
Use PGP Viewer to open (decrypt, verify, and display) encrypted message files of the following types:

- ***.pgp:** Created by a PGP application.
- ***.eml**: Created by Outlook Express or Thunderbird.
- ***.emlx**: Created by Apple's Mail.app program on Mac OS X systems.
- ***.msg**: Created by Microsoft Outlook.

When PGP Viewer opens an encrypted message, it does not overwrite the encrypted text. The original message remains intact.

To decrypt, verify, and display an encrypted message from a file

1 Open PGP Viewer. To do this, select the PGP icon in the system tray and then select PGP Viewer or from within PGP Desktop select the PGP Viewer control box.



2 Click **Open File in PGP Viewer** or pull down the **Viewer** menu and select **Open File in PGP Viewer**.

The **Open Message File** dialog appears.

3 In the Open Message File dialog box, navigate to the file you want to open, select it, then click **Open**. PGP Viewer decrypts, verifies, and displays the message in a separate window.

Tip: You can drag and drop the file you want to open onto the portion of the PGP Viewer windows that displays: **Drag Email or Files Here**. PGP Viewer opens the file, decrypts and verifies it, and displays the message.

4 To open another message, click **Open Message** in the toolbar, navigate to the desired file, select it, then click **Open**. PGP Viewer decrypts, verifies, and displays the message. A pane on the left side of the PGP Viewer screen is displayed so that you can see all open messages.

5 To open a pane on the left side of the PGP Viewer window or to close the pane if it is open, click the Pane button on the toolbar.

Copying Email Messages to Your Inbox

Use PGP Viewer to copy plaintext versions of decrypted messages to the inbox of your email client.

To copy a message to the inbox of your email client

1. With the message in the PGP Viewer window, click **Copy to Inbox**. The Copy to Inbox confirmation dialog box displays the name of the email client to which the message will be copied. To change this setting, see *Specifying Options in PGP Viewer* (on page 133).
2. Click **OK** to continue.

   If you are copying a message to the Mozilla Thunderbird email client for the first time, a dialog box displays, advising that you must install an add-on.

   Click **Yes** to install the add-on and follow the on-screen instructions or click **No**. You must be using Thunderbird 2.0 or greater to install the add-on.
3. PGP Viewer opens your email client and copies a plaintext version of the message to the inbox.

Exporting Email Messages

Use PGP Viewer to export a decrypted message to a file.

To export a message from PGP Viewer to a file

1. With the message displayed in the PGP Viewer window, click **Export**. The Export Message File dialog is displayed.
2. In the Export Message File dialog box, specify the desired location, filename, and format for the file, then click **Save**. PGP Viewer saves the file to the specified location.

Specifying Additional Options

Use the Tools button on the PGP Viewer Toolbar (on the far right) to specify several PGP Viewer features:

- **Text Encoding**: Specify the text encoding format for the message currently being displayed by PGP Viewer.

- **Show Remote Images**: Display external resources (images, CSS style sheets, iframe content, and so on) for the message currently being displayed by PGP Viewer. You can specify that PGP Viewer automatically displays external resources in Preferences.
- **View Message Source**: Display the source of the message currently being displayed by PGP Viewer. Viewing the message source can tell you more information about the message.
- **Preferences**: Display the PGP Viewer Preferences dialog box.

Specifying Options in PGP Viewer

PGP Viewer includes options (preferences) that provide control of certain functionality.

To access PGP Viewer preferences

1. Open PGP Viewer from the PGP tray or use PGP Viewer to decrypt, verify, and display a message.

   The PGP Viewer screen appears.
2. Click the Tools icon (on the far right of the PGP Viewer Toolbar) and select **Preferences**. The Preferences dialog box is displayed.
3. Select the General tab and specify the following options:
   - **Ask user to confirm Copy to Inbox command**: Controls whether or not a confirmation prompt is displayed when you copy text from PGP Viewer to the inbox of your email client. The default is enabled.
   - **Automatically load remote images**: Controls whether external resources like images, CSS style sheets, or iframe content, for example, are automatically loaded by PGP Viewer. The default is disabled, as this may be a security risk.
   - **Use email client**: Lets you specify the email client to which PGP Viewer will copy content. The default is **Windows Default (Email)**; PGP Viewer determines your default Windows email and uses that as its default. You can also select **Outlook**, **Outlook Express**, and **Thunderbird**.
4. Select the Text tab, and specify the following options:
   - **Font**: Controls the font PGP Viewer uses to display text.
   - **Text Color**: Controls the color of text that PGP Viewer displays.
   - **Background Color**: Controls the background color of text that PGP Viewer displays.

Security Features in PGP Viewer

PGP Viewer proactively protects your security:

- The Web browser embedded in PGP Viewer, which displays messaging content, has JavaScript, Java Applets, and plugins disabled. This prevents an attacker from delivering a malicious payload that PGP Viewer might otherwise load.
- External resources — images, CSS style sheets, iframe content (an inline frame that contains another document), and so on — are loaded automatically based on the **Automatically load remote images** preference. For security purposes, this preference is disabled by default. When this preference is disabled, PGP Viewer does not generate any network traffic to external sites.

10 Protecting Disks with PGP Whole Disk Encryption

PGP Whole Disk Encryption (PGP WDE) locks down the entire contents of a laptop, desktop, external drive, or USB flash drive, including boot sectors, system files, and swap files. You can also use PGP WDE to encrypt just the boot partition or Windows partitions. Encryption runs as a background process that is transparent to you, automatically protecting valuable data without requiring you to take additional steps.

Note: If you are using PGP Desktop in a PGP Universal Server-managed environment, your PGP Universal Server administrator may have disabled certain features. When a feature is disabled, the control item in the left side is not displayed and the menu and other options for that feature are not available. The graphics included in this guide depict the default installation with all features enabled. If your PGP Universal Server administrator has disabled this functionality, this section does not apply to you.

If you are using PGP Desktop in a PGP Universal Server-managed environment, your PGP administrator may have specified, by policy, that all boot drives must be encrypted. If this is the case, PGP Desktop periodically verifies that drives are encrypted and will enforce policy by automatically encrypting unencrypted boot drives.

If you are using PGP Desktop in a PGP Universal Server-managed environment, your PGP administrator may have customized the PGP Whole Disk Encryption BootGuard screen to include additional text or a custom image such as your organization's logo. The graphics included in this guide depict the default installation. Your actual login screen may look different if your administrator has customized the screen.

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About PGP Whole Disk Encryption

When you encrypt an entire disk using the PGP Whole Disk Encryption feature, every sector is encrypted using a symmetric key. This includes all files including operating system files, application files, data files, swap files, free space, and temp files.

On subsequent reboots, PGP WDE prompts you for the correct passphrase. Then the encrypted data is decrypted as you access it. Before any data is written to the disk, PGP WDE encrypts it. As long as you are authenticated to your PGP WDE-encrypted disk (after you have entered the correct passphrase at the PGP BootGuard screen), the files are available. When you shut down your system, the disk is protected against use by others.

Before encrypting your disk with PGP WDE, it is important to understand the process of creating and using a PGP WDE-encrypted disk:

1. Make sure that your PGP Desktop license supports its use, as described in *Licensing PGP Whole Disk Encryption* (on page 137).
2. Perform the tasks to *Prepare Your Disk for Encryption* (on page 138).
3. Choose how you want to authenticate yourself to encrypt the disk in *Determine the Authentication Method for the Disk* (see "Determining the Authentication Method for the Disk" on page 145).

4 Choose the encryption options to use in *Setting Encryption Options* (on page 148).

5 Start the encryption process in *Encrypting a Disk or Partition* (on page 154).

6 Learn how to use an encrypted disk in *Using a PGP WDE-Encrypted Disk* (on page 159).

7 Learn how to maintain your encrypted disk in *Maintaining the Security of Your Disk* (on page 168).

8 Learn how to decrypt the disk, if needed, in *Decrypting a PGP WDE-Encrypted Disk* (on page 183).

9 Understand the features that help avoid security problems in Special Security Precautions Taken by PGP Desktop.

If you are a PGP Universal Administrator, or are using PGP WDE in a PGP Universal Server-managed environment, see *Using PGP-WDE in a PGP Universal Server-Managed Environment* (see "Using PGP WDE in a PGP Universal Server-Managed Environment" on page 178) for additional information.

Warning: Once you unlock a disk, its files are available to you—as well as anyone else who can physically use your system. Your files are unlocked until you lock them again by shutting down your computer. Use a PGP Virtual Disk volume for files that need to be secured even while your computer is in use. For more information, see *Using PGP Virtual Disks* (on page 189).

How does PGP WDE Differ from PGP Virtual Disk?

The PGP Virtual Disk feature differs from PGP WDE in that PGP Virtual Disks perform like additional volumes on your system that can be locked, even while you are using your computer. These volumes are like a vault where you can store files needing protection. There is no actual physical disk, only the virtual one that the PGP Virtual Disk feature creates and manages.

PGP WDE protects your entire physical hard disk.

Both products work independently of each other, so you can use them at the same time. For more information, see *Using PGP Virtual Disks* (on page 189).

Licensing PGP Whole Disk Encryption

To use the PGP Whole Disk Encryption feature, your copy of PGP Desktop must have a license that supports it.

To verify your license supports PGP Whole Disk Encryption

1 Open PGP Desktop.

2 Select **Help > License**. The PGP Desktop License dialog box is displayed.

3 In the **Product Information** section, find the **PGP Whole Disk Encryption** icon. Move your cursor over the product name to see information about the product and to find out if you are currently licensed to use it.

If your license does not support PGP WDE, you can find more information about licensing PGP Desktop using one of the following methods:

- If you are using PGP Desktop in a PGP Universal Server-managed environment, contact your PGP administrator for more information about support for the PGP WDE feature in your license. For more information, see *Using PGP Desktop with PGP Universal Server* (on page 309).
- If you are using PGP Desktop outside of a PGP Universal Server-managed environment, go to the *PGP Corporation website* (http://www.pgp.com) for more information about adding the PGP WDE feature to your license.

License Expiration

PGP WDE used under a subscription license basis provides a 90-day post-license expiration decryption feature for boot disks only. 90 days after the subscription license expires, the PGP WDE feature decrypts your data (after notifying you) so you can retrieve your files.

Prepare Your Disk for Encryption

Before you encrypt your disk, there are a few tasks you must perform to ensure successful initial encryption of the disk.

- **Determine whether your target disk is supported.** See *Supported Disk Types* (on page 139).
- **Make sure your keyboard type is supported.** See *Supported Keyboards* (on page 140).
- **Ensure the health of the disk before you encrypt it**. If PGP WDE encounters disk errors during encryption, it will pause encryption so you can repair the disk errors. However, it is more efficient to repair errors before you initiate encryption. See *Ensure Disk Health Before Encryption* (on page 142).
- **Back up the disk before you encrypt it**. Before you encrypt your disk, be sure to back it up so that you won't lose any data if your laptop or computer is lost, stolen, or you are unable to decrypt the disk. Also be sure to make regular backups of your disk.

- **Create a recovery disk.** While the chances are extremely low that a master boot record could become corrupt on a boot disk or partition protected by PGP Whole Disk Encryption, it is possible. Before you encrypt a boot disk or partition using PGP Whole Disk Encryption, create a recovery disk. See *Creating Recovery Disks* (see "Creating and Using Recovery Disks" on page 181).
- **Consider the time it will take to encrypt the disk** and prepare accordingly. See *Calculate the Encryption Duration* (on page 143).
- **Be certain that you will have AC power** for the duration of the encryption process. See *Maintain Power Throughout Encryption* (on page 144).
- **Run a pilot test to ensure software compatibility.** As a good security practice, PGP Corporation recommends testing PGP WDE on a small group of computers to ensure that PGP WDE is not in conflict with any software on the computer before rolling it out to a large number of computers. This is particularly useful in environments that use a standardized Corporate Operating Environment (COE) image. Certain other disk protection software is incompatible with PGP WDE and can cause serious disk problems, up to and including loss of data. See *Run a Pilot Test to Ensure Software Compatibility* (on page 144) for known interoperability issues, and review the *PGP Desktop Release Notes* for the latest updates to this list.
- **Ensure you have the correct token and drivers**. If you are using a USB token for authentication to a fixed disk protected using PGP Whole Disk Encryption, make sure you have the correct token and you have installed the proper driver software. See *Preparing a Token to Use For Authentication* (see "Preparing a Smart Card or Token to Use For Authentication" on page 149).
- **Using Windows Server software**, For additional system requirements and best practices information on using PGP WDE on Windows Server systems, see *PGP KB article 1737* (http://support.pgp.com/?faq=1737).

Supported Disk Types

The PGP WDE feature protects the contents of the following types of disks:

- Desktop or laptop disks, including solid-state drives (either partitions, or the entire disk).
- External disks, excluding music devices and digital cameras.
- USB flash disks.

You can encrypt FAT16, FAT32, and NTFS formatted disks or partitions. If you use PGP Whole Disk Encryption with a FAT disk or partition, you can later convert it to NTFS.

You can use the PGP Whole Disk Encryption feature on a dual-boot system, as long as you boot to an operating system supported by PGP WDE (such as Windows XP, Windows 2000, or Windows Vista) and PGP Whole Disk Encryption is installed. Partition mode supports dual-booting with another operating system (such as Linux) as long as you encrypt only your Windows partition. The other operating system must be on another, non-encrypted partition.

There is no minimum or maximum size for a PGP WDE-encrypted disk. If the disk or partition is supported by the operating system (or your hardware BIOS for the boot disk or partition), it should work with PGP Desktop.

If you want to re-partition a drive that has been encrypted with PGP WDE, you must first decrypt the drive. After you have decrypted the drive, you can then partition the drive and re-encrypt the partition(s).

All Windows power management modes (Hibernation, Standby, Suspend) are supported.

Unsupported Disk Types

The following disk types are *not* supported:

- Dynamic disks.
- Diskettes and CD-RW/DVD-RWs.

Warning: Windows XP allows basic disks to be converted to dynamic disks, which support some features that basic disks do not. Never perform this conversion on the boot drive of a system that has already been protected using PGP Whole Disk Encryption. This conversion, from a basic-type disk to a dynamic one, renders the drive unusable.

Encryption Algorithm Used by PGP WDE

The encryption algorithm used by PGP WDE is AES-256. The hashing algorithm is SHA-1. You cannot change these options.

Supported Keyboards

Be sure that you are using a keyboard with one of the supported languages.

The PGP Whole Disk Encryption log-in screen supports the following keyboard layouts:

- Belgian (Belgium; Comma)
- Belgian (Belgium; Period)
- Bosnian (Bosnia)
- Bosnian (Bosnia; Cyrillic)
- Bulgarian (Bulgaria)

- Bulgarian (Bulgaria; Latin)
- Bulgarian (Bulgaria; Typewriter)
- Canadian Multilingual Standard (Canada)
- Chinese Simplified (China, Singapore)
- Chinese Traditional (Hong Kong, Taiwan)
- Croatian (Croatia)
- Czech (Czechoslovakia; QWERTY)
- Danish (Denmark)
- Dutch (The Netherlands)
- English (United States)
- English (United Kingdom)
- English (US-International)
- Estonian (Estonia)
- Finnish (Finland)
- French (Belgium)
- French (Canada)
- French (France)
- French (Switzerland)
- German (Germany/Austria)
- German (IBM)
- German (Switzerland)
- Hebrew (Israel)
- Hungarian (Hungary)
- Hungarian (Hungary; 101 keys)
- Icelandic (Iceland)
- Irish (Ireland)
- Italian (Italy)
- Italian (Italy; 142 keys)
- Japanese (Japan)
- Korean (Korea)
- Norwegian (Norway)
- Polish (Poland; Programmers)
- Polish (Poland; 214 keyboard)
- Portuguese (Brazil; ABNT keyboards)

- Portuguese (Brazil; ABNT2 keyboards)
- Portuguese (Portugal)
- Romanian (Romania)
- Russian (Russia; Cyrillic)
- Serbian (Serbia and Montenegro; Cyrillic)
- Serbian (Serbia and Montenegro; Latin)
- Slovak (Slovakia)
- Slovenian (Slovenia)
- Spanish (Spain)
- Spanish (Latin America)
- Spanish Variation
- Swedish (Sweden)
- Turkish (Turkey; F)
- Turkish (Turkey; Q)
- Ukrainian (Ukraine)

Different keyboard layouts can have different mappings between characters, potentially causing problems when you enter your passphrase to authenticate. Select the keyboard layout that most closely maps to the keyboard you are using, then make sure to use that same layout each time you authenticate.

For information on supported characters for passphrases, see *Supported Characters for PGP WDE Passphrases* (on page 155).

Ensure Disk Health Before Encryption

PGP Corporation deliberately takes a conservative stance when encrypting drives, to prevent loss of data. It is not uncommon to encounter Cyclic Redundancy Check (CRC) errors while encrypting a hard disk. If PGP WDE encounters a hard drive or partition with bad sectors, PGP WDE will, by default, pause the encryption process. This pause allows you to remedy the problem before continuing with the encryption process, thus avoiding potential disk corruption and lost data.

To avoid disruption during encryption, PGP Corporation recommends that you start with a healthy disk by correcting any disk errors prior to encrypting.

Note: If you are using PGP Desktop in a PGP Universal Server-managed environment, the bad sectors encountered during encryption are logged to the PGP Universal Server and the encryption process continues.

Best Practices Recommendation

As a best practice, before you attempt to use PGP WDE, use a third-party scan disk utility that has the ability to perform a low-level integrity check and repair any inconsistencies with the drive that could lead to CRC errors. Microsoft Windows' Check Disk (`chkdsk.exe`) utility is not sufficient for detecting these issues on the target hard drive. Instead, use software such as SpinRite or Norton Disk Doctor™. These software applications can correct errors that would otherwise disrupt encryption.

Caution: As a best practice, highly fragmented disks should be defragmented before you attempt to encrypt them.

If you are installing PGP WDE on a Windows Server system, see *PGP KB article 1737* (http://support.pgp.com/?faq=1737) for additional best practices information.

Calculate the Encryption Duration

Encryption is a time-consuming and CPU-intensive process. The larger the disk or partition being encrypted, the longer the encryption process takes. You should consider this as you schedule initial encryption of the disk.

Factors that may affect encryption speed include:

- the size of the disk or partition
- the processor speed and number of processors
- the number of system processes running on the computer
- the number of other applications running on the system
- the amount of processor time those other applications require

With an average system, an 80 GB boot disk or partition takes approximately three hours to encrypt using PGP Whole Disk Encryption (when no other applications are running). A very fast system, on the other hand, can easily encrypt such a disk or partition in less than an hour.

You can still use your system during encryption. Your system is somewhat slower than usual during the encryption process, although it is fully usable.

PGP Desktop automatically slows the encryption process if you are using the system. The encryption process is faster if you avoid using your computer during the initial encryption. The system returns to normal operation when the encryption process is complete.

If you decide to run other applications during the encryption process, those applications will probably run slightly slower than normal until the encryption process is over.

If you will not be using the computer during encryption, you can speed up initial encryption using the **Maximum CPU Usage** option, described in *Setting Encryption Options* (on page 148). The extra speed during encryption comes primarily by taking priority over other operations that your computer is performing.

Maintain Power Throughout Encryption

Because encryption is a CPU-intensive process, encryption cannot begin on a laptop computer that is running on battery power. The computer *must* be on AC power. If a laptop computer goes on battery power during the initial encryption process (or a later decryption or re-encryption process) PGP WDE pauses its activity. When you restore AC power, the encryption, decryption, or re-encryption process resumes automatically.

Regardless of the type of computer you are working with, your system must not lose power, or otherwise shut down unexpectedly, during the encryption process, unless you have selected the **Power Failure Safety** option. Do not remove the power cord from the system before the encryption process is over. If loss of power during encryption is a possibility—or if you do not have an uninterruptible power supply for your computer—consider choosing t**he Power Failure Safety** option described in *Setting Encryption Options* (on page 148).

Caution: This holds true for removable disks, such as USB devices. Unless you have selected the **Power Failure Safety** option, you run the risk of corrupting the device if you remove it during encryption.

Run a Pilot Test to Ensure Software Compatibility

As a good security practice, PGP Corporation recommends testing PGP WDE on a small group of computers to ensure that PGP WDE is not in conflict with any software on the computer before rolling it out to a large number of computers. This is particularly useful in environments that use a standardized Corporate Operating Environment (COE) image.

Certain other disk protection software is incompatible with PGP WDE and can cause serious disk problems, up to and including loss of data. Please note the following known interoperability issues, and please review the PGP Desktop Release Notes for the latest updates to this list.

Software that is not compatible:

- Faronics Deep Freeze (any edition)
- Utimaco Safeguard Easy 3.x
- Absolute Software's CompuTrace laptop security and tracking product. PGP Whole Disk Encryption is compatible only with the BIOS configuration of CompuTrace. Using CompuTrace in MBR mode is not compatible.

- Hard disk encryption products from GuardianEdge Technologies: Encryption Anywhere Hard Disk and Encryption Plus Hard Disk products, formerly known as PC Guardian products.

The following programs co-exist with PGP Desktop on the same system, but will block the PGP Whole Disk Encryption feature:

- Safeboot Solo
- SecureStar SCPP

Determining the Authentication Method for the Disk

When you encrypt a disk or partition using PGP Whole Disk Encryption, you choose a method that determines how you will authenticate yourself to decrypt the disk.

You have the following options:

- *Passphrase and Single Sign-On Authentication* (on page 145)
- *Public Key Authentication* (on page 146)
- *Token-Based Authentication* (on page 146)
- *Two-Factor Authentication Using a USB Flash Device* (on page 146)
- *Trusted Platform Module (TPM) Authentication* (on page 147)

Note: On a multi-user system, be sure to create separate authentication methods for each user.

Note: To authenticate users using Windows PE or BartPE, you must use passphrase users. Token or TPM users are not supported.

Passphrase and Single Sign-On Authentication

With passphrase authentication, you specify a passphrase to use when you reboot a computer with an encrypted boot disk or partition, or if you attempt to access any other encrypted disk or partition. This method requires no additional files or hardware, and can be used with fixed as well as removable disks.

You have two options with passphrase authentication:

- You can choose a passphrase that you use only with PGP WDE.
- You can synchronize your PGP WDE passphrase with your Windows Account logon, so you only need to type your passphrase once to unlock your encrypted disk or partition and to log in to Windows. If synchronized with your Windows login, this option is known as *Single Sign-On (SSO)*.

For instructions on setting up Single Sign-On, see *Using PGP WDE Single Sign-On* (on page 165).

Public Key Authentication

With public-key authentication, you specify a public key when encrypting a disk or partition using PGP Whole Disk Encryption. Only the holder of the corresponding private key can access the contents of the disk or partition. To do that, they must provide the passphrase of their private key.

Public key authentication is available only for removable disks you use with your system. Fixed disks, including boot disks, partitions, or disks in USB enclosures, can use either passphrase or token authentication—not public key authentication.

Token-Based Authentication

If you are using the PGP WDE feature to encrypt a fixed disk (including your boot disk or partition) and for authentication you want to use a PGP key on a token, you must use a PGP keypair on a token or smart card that is compatible with PGP WDE. For a list of compatible devices, see *Using Smart Cards to Authenticate at the PGP BootGuard Screen* (see "Using Smart Cards or Tokens to Authenticate at the PGP BootGuard Screen" on page 150).

Using a keypair on a token adds an extra level of security, as you can take the token away with you.

Note that you must install the appropriate drivers for your device before you can proceed with disk encryption. For more information, see *Preparing a Token to Use For Authentication* (see "Preparing a Smart Card or Token to Use For Authentication" on page 149).

Two-Factor Authentication Using a USB Flash Device

You can use two-factor authentication to increase the security of data on your system. Two-factor authentication uses "something you know" (your passphrase) and "something you have" (your USB flash device) to verify that you are who you say you are and are entitled to access the disk.

With two-factor authentication, create a passphrase user and then select another form of hardware to identify the user. Choose between using a USB flash drive or, if the hardware is available on your system, Trusted Platform Module (TPM).

Note: If you use a USB flash device for two-factor authentication, you must reboot your computer with the USB device inserted in order for this authentication method to take effect. Until you reboot with the USB device, you can authenticate at the PGP BootGuard screen using only your passphrase.

For more information on creating two-factor authentication using a USB flash device, see *Encrypting the Disk* (on page 156).

Trusted Platform Module (TPM) Authentication

If Trusted Platform Module (TPM) hardware is available on your system, the option to use TPM is available. Adding a user with TPM means that the user can only authenticate to the disk on this particular system (the user is "locked" to the system). TPM can be used only with passphrase users and works with Single Sign-On.

PGP Whole Disk Encryption is compatible with TPM version 1.1 or 1.2.

Computers that support TPM and are compatible with PGP WDE include the following:

- Hewlett-Packard Compaq nx6325 (Infineon TPM with HP BIOS)
- Dell D630 (Broadcom TPM)
- Lenovo ThinkPad T60 (Atmel TPM)
- Fujitsu LifeBook T2010, (Infineon TPM with Phoenix BIOS)
- Panasonic Toughbook T5, W5, or Y5 (Infineon TPM with Matsushita BIOS)

Your TPM vendor may implement security features that affect usage of the TPM. Please consult the documentation for your system for information.

Note: If you clear your TPM by resetting it to factory settings, or if your system board containing the TPM is replaced, you will not be able to access your encrypted disk when using the TPM user because your credentials stored on the TPM are no longer accessible. Ensure that you have an alternate method to access your encrypted disk (see the following section on "Special Considerations when using TPM."

For more information on creating two-factor authentication using TPM, see *Encrypting the Disk* (on page 156).

Why TPM?

Computers with TPM have an on-board secure random number generator which can be queried and used as a source of random bits. It can generate, load, and work with 2048 bit RSA keys. In addition, it has anti brute-forcing features. If an incorrect passphrase is entered too many times, the TPM locks up or drastically slows down its responses, making brute force passphrase guessing too slow to be useful. This gives TPM keys protected by passphrases a much higher level of security than is available with software.

Special considerations when using TPM

- Before you encrypt your disk, be sure that you establish ownership of the TPM on your system, configure the TPM, and then reboot your system before starting the encryption process. When you take ownership you set up a passphrase for TPM (separate from PGP Desktop or Windows) that is used to edit the TPM. Establishing ownership allows you to configure and use products with TPM.
- Ensure that you have an alternate method of authenticating to your encrypted disk. If you are using PGP WDE in a PGP Universal Server-managed environment, you can use your Whole Disk Recovery Token (for more information, see *Creating a Recovery Token* (on page 180)). If you are using PGP WDE in a standalone environment, create a passphrase user as a backup, or create a a passphrase user with a USB flash device for two-factor authentication (for more information, see *Encrypting the Disk* (on page 156)).

Setting Encryption Options

Once you have completed the tasks for getting your disk ready for encryption, you should review the process for starting initial encryption:

1. Choose whether to encrypt the entire disk or specific partitions. See *Partition-Level Encryption* (on page 149).
2. Choose options to use during encryption, such as power failure safety or greater encryption speed. See *Using PGP Whole Disk Encryption Options* (on page 152).
3. Select your choice of authentication. See *Determine the Authentication Method for the Disk* (see "Determining the Authentication Method for the Disk" on page 145).

   Note: If you are using token-based authentication, make sure your token is ready for use. See *Preparing a Token to Use For Authentication* (see "Preparing a Smart Card or Token to Use For Authentication" on page 149).
4. Encrypt the disk as described in *Encrypting a Disk or Partition* (on page 154).

   Note: If you are a PGP Universal Server-managed user, PGP WDE creates a Recovery Token to use to recover disks for which the passphrase has been forgotten. See *Creating a Recovery Token* (on page 180).

Partition-Level Encryption

If your disk is divided into partitions, you can choose to encrypt by partition, rather than encrypting the entire disk. You can use this flexibility to encrypt:

- One disk partition.
- All disk partitions except one.
- Any number of partitions in-between.

Only the files on the partition(s) that you have selected are encrypted.

Partition mode supports dual-booting with another operating system (such as Linux) as long as you encrypt only your Windows partition. The other operating system must be on another, non-encrypted partition.

Note: Once a disk or any of its partitions have been encrypted, you cannot change the disk's partitioning (for example, adding or removing a partition, or resizing an existing partition). Make sure the disk is partitioned the way you want it *before* protecting it with PGP Whole Disk Encryption.

Preparing a Smart Card or Token to Use For Authentication

If you choose to authenticate with a smart card or token, please note that you must use a compatible device (for a list of compatible devices, see *Using Smart Cards to Authenticate at the PGP BootGuard Screen* (see "Using Smart Cards or Tokens to Authenticate at the PGP BootGuard Screen" on page 150)).

- Use the proper token model.
- Consider adding other users (a passphrase user, for example) to the encrypted disk in case the token is ever lost.
- Install the token's drivers on the system on which you will use the token *before* you use the token.

Requirements for Using Smart Cards or Tokens for Authentication

Please review these requirements and ensure you meet them prior to encryption.

Warning: Using a keypair on a token to authenticate to a disk or partition encrypted using PGP Whole Disk Encryption increases your security, but if you lose the token you can no longer authenticate to the PGP BootGuard login screen, and all the data on the disk or partition is lost. For this reason, consider adding other users (passphrase, token, or both) to a disk or partition encrypted using PGP Whole Disk Encryption. If your token is lost or stolen, those additional users can authenticate and unlock the disk or partition for you.

- You can use only keypairs stored on the token. You must either create a keypair on the Aladdin eToken, or send an existing keypair to the token by choosing **Add To** from the right-click shortcut menu.
- When you create a keypair on a token, or when you send an existing keypair to the token, the passphrase to the private key of that keypair changes to the PIN of the token. For an Aladdin eToken, the default PIN is 1234567890. Because this is a well-known default PIN, you should immediately change the PIN using Aladdin's configuration tools so that the security of the keypair is not severely reduced.

Using Smart Cards or Tokens to Authenticate at the PGP BootGuard Screen

This section describes the system requirements (compatible smart cards/tokens and readers) and provides instructions for using smart cards to authenticate at the PGP BootGuard screen.

Compatible Smart Card Readers for PGP WDE Authentication

The following smart card readers are compatible when communicating to a smart card at pre-boot time. These readers can be used with any compatible removable smart card (it is not necessary to use the same brand of smart card and reader).

Generic smart card readers

Most CCID smart card readers are compatible. The following readers have been tested by PGP Corporation:

- OMNIKEY CardMan 3121 USB for desktop systems (076b:3021)
- OMNIKEY CardMan 6121 USB for mobile systems (076b:6622)
- ActivIdentity USB 2.0 reader (09c3:0008)
- SCM Microsystem Smart Card Reader model SCR3311

CyberJack smart card readers

- Reiner SCT CyberJack pinpad (0c4b:0100).

ASE smart card readers

- Athena ASEDrive IIIe USB reader (0dc3:0802)

Embedded smart card readers

- Dell D430 embedded reader
- Dell D630 embedded reader
- Dell D830 embedded reader

Compatible Smart Cards or Tokens for PGP WDE Authentication

PGP Whole Disk Encryption is compatible with the following smart cards for pre-boot authentication:

- ActiveIdentity ActivClientCAC cards, 2005 model
- Aladdin eToken PRO 64K, 2048 bit RSA capable
- Aladdin eToken PRO USB Key 32K, 2048 bit RSA capable
- Aladdin eToken PRO without 2048 bit capability (older smart cards)
- Aladdin eToken PRO Java 72K
- Aladdin eToken NG-OTP 32K

  Note: Other Aladdin eTokens, such as tokens with flash, should work provided they are APDU compatible with the compatible tokens. OEM versions of Aladdin eTokens, such as those issued by VeriSign, should work provided they are APDU compatible with the compatible tokens.

- Athena ASEKey Crypto USB Token for Microsoft ILM

  Athena ASECard Crypto Smart Card for Microsoft ILM **Note:** The Athena tokens are compatible only for credential storage.

- Axalto Cyberflex Access 32K V2
- Charismathics CryptoIdentity plug 'n' crypt Smart Card only stick
- EMC RSA SecurID 800 Rev A, B, and D

  Note: This token is compatible only for key storage. SecurID is not compatible.

- EMC RSA Smart Card 5200
- Marx CrypToken USB token
- Rainbow iKey 3000
- S-Trust StarCOS smart card

  Note: S-Trust SECCOS cards are not compatible.

- SafeNet iKey 2032 USB token
- T-Systems Telesec NetKey 3.0 smart card
- T-Systems TCOS 3.0 IEI smart card

Personal Identity Verification (PIV) cards

- Oberthur ID-One Cosmo V5.2D personal identity verification cards using ActivClient version 6.1 client software.
- Giesecke and Devrient Sm@rtCafe Expert 3.2 personal identity verification cards using ActivClient version 6.1 client software.

Required Drivers for the Aladdin eToken

Before you use the Aladdin eToken, install the latest software drivers on the system on which you will be using the token. Microsoft Windows may recognize the token generically if you do not install the software drivers, but PGP Desktop *requires* the appropriate software drivers to be installed. You can obtain the latest software drivers from the *Aladdin Support Web site* (http://www.aladdin.com/support/default.asp).

Download the latest version of the **eToken PKI Client (RTE)** driver software (version 4.5 was the current version when this document was written), then install it on your system. When the installation of the eToken PKI client driver software on your system is complete, open PGP Desktop and click the PGP Keys control box. If the driver software was installed correctly, you see **Smart Card Keys** listed in the PGP Keys control box.

If you see **No suitable key available** in the **Select Key** field when you specify **Token Key User** as your method of authentication for the disk or partition you are encrypting using PGP Whole Disk Encryption, it means one of several things:

- Your Aladdin eToken is not inserted.
- The driver software is not the right version, or was not installed correctly.
- The keypair on the token cannot be used, or there is no key on the eToken (that is, the eToken is empty).

Using PGP Whole Disk Encryption Options

The PGP Whole Disk Encryption feature offers two options that you can select prior to protecting your disk or partition:

- **Maximum CPU Usage.** This is the fastest way to perform initial encryption on your disk using PGP Whole Disk Encryption, yet it is just as safe. This extra speed comes primarily by taking priority over other operations that your computer is performing. Consider this option for a time when you are away from your computer.

- **Power Failure Safety.** While you can pause the initial encryption process at any time by properly shutting down or restarting your computer, it is exceptionally important to avoid unexpected shutdowns (power failures, power cord gets pulled out, and so on). If this is a possibility for you—or if you do not have an uninterruptible power supply for your computer—consider choosing the **Power Failure Safety** option. When **Power Failure Safety** is selected, encrypting is journaled; if the power fails, the encryption process can safely and accurately resume where it was interrupted. However, this option can cause initial encryption to take several times longer to complete.

  This is also useful when encrypting USB devices. Interrupting encryption by removing a USB device during encryption can corrupt the device and require that it be reformatted. Encrypting with Power Failure Safety mode permits you to remove the USB device during encryption and resume encryption once it is reinserted.

Use this table to help you decide which options are best for you:

Option Selected	Benefits	Things to consider
Neither Option (Normal)	Encrypts the disk or partition with a good combination of speed and safety. You can use the computer while the disk or partition is being encrypted. Best for most users.	Encryption runs at the standard speed. You must make sure that the computer does not shut down unexpectedly, or data loss may occur.
Maximum CPU Usage	Encrypts the disk or partition more quickly than Normal mode. Despite additional speed, is as safe as encryption using Normal mode.	This option takes maximum computer power, so your system is much less responsive than usual while the disk or partition is being encrypted.
Power Failure Safety	Encrypts your disk or partition using a method with which it can safely resume encryption easily, even if power is interrupted. Good for locations where power loss is a risk.	Takes much longer than Normal mode.

Option Selected	Benefits	Things to consider
Both Options	Protects the disk or partition with the extra safety of Power Failure Safety mode. Works faster than Power Failure Safety mode alone.	Is still considerably slower than Normal mode.

Encrypting a Disk or Partition

Once you have prepared the disk and specified encryption options, you can encrypt the disk or partition. Note the following before you begin:

- If you are using a USB token for authentication to a fixed disk protected using PGP Whole Disk Encryption, make sure you have the correct token and you have installed the proper driver software. For more information, see *Token-Based Authentication* (on page 146).

  Note: Token-based authentication is not available for Single Sign-On.

- Your system is somewhat slower than usual during the encryption process, although it is fully usable. It returns to normal operation when the encryption process is complete.

  PGP Desktop automatically slows the encryption process if you are using the system. The encryption process is faster if you avoid using your computer during the initial encryption.

- You can minimize or close PGP Desktop during encryption. This does not affect the process, but it does improve the speed of the encryption process.

- To stop the encryption process for a short time, click **Stop**, then click **Pause** on the dialog box. Click **Resume** to restart. You may need to authenticate after you click **Resume**.

- To shut down the system before the encryption process is over, perform a normal shutdown. You do not need to pause the process. When you restart, the encryption process automatically resumes where it left off.

- You can only encrypt, decrypt, or re-encrypt one disk or partition at a time. Once you begin an operation on a disk or partition, you cannot start encrypting another one until the process is complete on the first. You cannot circumvent this by pausing the first operation.

Supported Characters for PGP WDE Passphrases

The PGP Whole Disk Encryption feature supports alphanumeric characters, punctuation characters, standard meta-characters, and extended ASCII characters when creating passphrases. Tab and control characters are not supported. As you choose a passphrase, please note the following.

The following characters are supported: `abcdefghijklmnopqrstuvwxyz ABCDEFGHIJKLMNOPQRSTUVWXYZ`

`0123456789`

`` `~!@#$%^&*()_+={}\|:;[]'"<>,.?/- ``

- Most extended ASII characters (such as ç é è ê ë î ï ô û ù ü ÿ) or symbols (such as ¢ ® œ), are supported.

The following table provides a list of characters that are not supported when entered as part of a passphrase for the associated keyboard:

Keyboard	Unsupported Characters
Italian (Italy)	`` `~ ``
Hebrew (Israel)	`abcdefghijklmnopqrstuvwxyz` `
Russian (Russia)	`abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ` `@#$^&{}|[]'<>~`
Bosnian (Bosnia; Cyrillic)	`abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ`
Bulgarian (Bulgaria)	`abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUWXYZ'[]<>{}@#$^&*`
Polish (Poland; 214 keys)	`[]|`
Serbian (Serbia; Cyrillic)	`abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ[]{}|@^`
Ukranian (Ukraine)	`abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ'[]` `<>{}|~@#$^&`

Encrypting the Disk

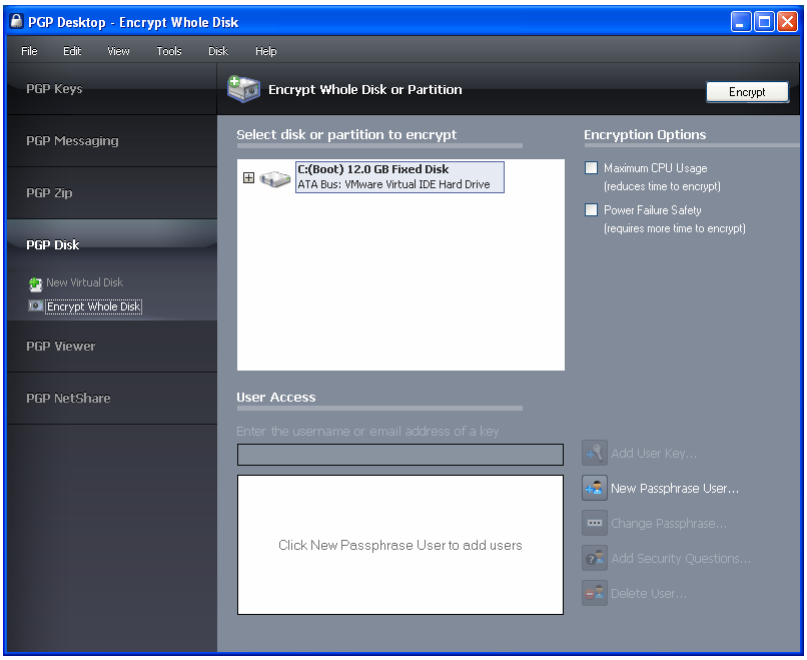
Before you encrypt your disk, be sure to back it up so that you won't lose any data if your laptop or computer is lost, stolen, or you are unable to decrypt the disk.

You can only encrypt, decrypt, or re-encrypt one disk or partition at a time. Once you begin an operation on a disk or partition, you cannot start encrypting another one until the process is complete on the first. You cannot circumvent this by pausing the first operation.

To protect a disk or partition using PGP Whole Disk Encryption

1 Open PGP Desktop and click on the PGP Disk Control box. The PGP Disk Control box highlights.

2 Click **Encrypt Whole Disk**. The Encrypt Whole Disk (Partition) work area displays, and you see a listing of the disks on your system that can be protected by PGP Whole Disk Encryption: disks, disk partitions, removable media, and so on.



3 In the Encrypt Whole Disk (Partition) work area, in the **Select disk or partition to encrypt** section at the top, click to select the disk or partition on your computer that you want to protect using PGP Whole Disk Encryption.

4 Choose the **Encryption Options** that you want to use, if any. For more information about your choices, see *Using PGP Whole Disk Encryption Options* (on page 152).

5 In the **User Access** section, specify how you want to access your protected disk or partition:

- **Token-based Public Key User**. If you are protecting a fixed (non-removable) disk on your system.
  - Type the user name or email address associated with the key, then press **Enter** to find the key. You can also select **Add User Key**. A list of the keypairs on your keyring is displayed. From the key source box, select the public key or keys that you want to use. Click **Add** to move the keys to the **Keys to add** field and then click **OK**. Click **Encrypt**.
- **Passphrase User**. If you want to protect your disk or partition with a passphrase, select **New Passphrase User**. The PGP Disk Assistant: Whole Disk Encryption - New User dialog box is displayed.
  - **To unlock your encrypted disk using your Windows Account Logon**, select **Use Windows Password** then click **Next.** In the PGP Disk Assistant: Two Factor Authentication dialog box, select **Proceed with Passphrase Authentication only** and click **Next.** In the PGP Disk Assistant: Windows Account Logon dialog box, type your Windows user name, domain, and password, and click **Next**. Click **Finish**.

  If you choose the **Use Windows Password** option, after initial encryption, use your Windows password when the PGP BootGuard screen is displayed at the start of booting. The PGP Single Sign-On (SSO) feature logs into Windows for you—you only need to type your passphrase once. (This is the Single Sign-On feature. For more information, see *Using PGP WDE Single Sign-On* (on page 165).)

  - **To unlock your encrypted disk or partition using a new passphrase**, select **Create New Passphrase,** then click **Next**. In the PGP Disk Assistant: Two Factor Authentication dialog box, select **Proceed with Passphrase Authentication only** and click **Next.** In the PGP Disk Assistant: Create Username and Passphrase dialog box, type the name of the new user and the passphrase you want associated with the user. Type the passphrase again in the **Confirm** field and click **Next**. Click **Finish**.
  - **To unlock your encrypted disk or partition using two-factor authentication with a passphrase and USB flash drive**, select **Create New Passphrase,** then click **Next**.

  In the PGP Disk Assistant: Two Factor Authentication dialog box, select **Generic USB Flash Device**, select the device from the list, and click **Next.** In the PGP Disk Assistant: Create Username and Passphrase dialog box, type the name of the new user and the passphrase you want associated with the user. Type the passphrase again in the **Confirm** field and click **Next**. Click **Finish**.

- **To unlock your encrypted disk or partition using two-factor authentication with a passphrase and TPM**, select **Create New Passphrase,** then click **Next**. In the PGP Disk Assistant: Two Factor Authentication dialog box, select **Trusted Platform Module**, and click **Next.** In the PGP Disk Assistant: Create Username and Passphrase dialog box, type the name of the new user and the passphrase you want associated with the user. Type the passphrase again in the **Confirm** field and click **Next**. Click **Finish**.

Normally, as an added level of security, the characters you type for the passphrase are not visible on the screen. However, if you are sure that no one is watching (either physically over your shoulder or scanning for the radio waves emitted by your monitor) and you would like to see the characters of your passphrase as you type, select the **Show Keystrokes** checkbox. See *The Passphrase Quality Bar* (on page 304).

Caution: It is strongly recommended that you use a supported keyboard layout when you are creating a passphrase for your disk or partition protected with PGP Whole Disk Encryption (for more information, see *Supported Keyboards* (on page 140)). The Whole Disk Encryption log-in screen assumes you are using one of these keyboard layouts when you type your passphrase to authenticate. Using a different keyboard layout could result in problems authenticating. For more information, see *Authenticating at the PGP BootGuard Screen* (on page 160).

6 Confirm that you have the user access arrangement that you want, then click **Encrypt**.

7 Read the information in the dialog box, and then click **OK**.

8 To see how much of the disk has been encrypted, refer to the **Encryption Progress** bar.

9 To stop the encryption process temporarily, click **Stop**, then click **Pause** in the dialog box is displayed. To resume, click **Resume**. You may be prompted for the appropriate passphrase.

Note: If the encryption process stops and PGP Desktop indicates a disk read/write error, it means that PGP Desktop has encountered bad sectors on your disk or partition during the encryption process. You can continue encryption or abort the process and fix the errors. See *Encountering Disk Errors During Encryption* (on page 159). If you are using PGP Desktop in a PGP Universal Server-managed environment, the bad sectors encountered during encryption are logged to the PGP Universal Server and the encryption process continues.

When the encryption process completes, the User Access section displays the user you used to encrypt the disk with, and additional user access options become available so you can add a new user, change the passphrase, or delete a user.

10 Once your disk has been encrypted, PGP Corporation recommends that you then create a recovery disk. For more information, see *Creating Recovery Disks* (see "Creating and Using Recovery Disks" on page 181).

Encountering Disk Errors During Encryption

Note: If you are using PGP Desktop in a PGP Universal Server-managed environment, the bad sectors encountered during encryption are logged to the PGP Universal Server and the encryption process continues.

Many hard disks have bad sectors. If PGP WDE encounters bad disk sectors during encryption, encryption pauses. You are warned that PGP WDE has encountered disk errors. (Note that these errors are unrelated to encryption; they are an indication that your hard disk needs maintenance.)

You can do one of the following:

- Force encryption to continue by clicking **Yes**. Disk errors are frequently encountered and often harmless. Clicking **Yes** will continue the encryption process and PGP WDE will ignore further errors.
- Stop encryption by clicking **No**, completely decrypt the disk, and then repair the disk errors using a tool such as SpinRite or Norton Disk Doctor before making another attempt to encrypt the disk. If you know that your disk is seriously fragmented or has many bad sectors, you should immediately perform the maintenance that your hard disk needs before encrypting the disk.

Using a PGP WDE-Encrypted Disk

Your computer boots up in a different way once you use PGP Whole Disk Encryption to protect the boot disk—or a secondary fixed disk—on your system. On power-up, the first thing you see is the PGP BootGuard log-in screen asking for your passphrase.

PGP WDE then decrypts the disk. If you enabled the Single Sign-On feature (that is, you synchronized your PGP WDE passphrase with your Windows Account logon), you are also logged on to Windows.

When you use a PGP WDE-encrypted disk, it is decrypted and opened automatically as needed. With most modern computers, after the disk is completely encrypted, there is no noticeable slowdown of your activities.

Once you unlock a disk or partition, its files are available to you—as well as anyone else who can physically use your system. Your files are unlocked until you lock them again by shutting down your computer.

Warning: Because your files remain unlocked until you lock them again, you may want to use a PGP Virtual Disk volume for files that need to be secured even while your computer is in use. See *Using PGP Virtual Disks* (on page 189).

When you shut down a system with an encrypted boot disk or partition, or if you remove an encrypted removable disk from the system, all files on the disk or partition remain encrypted and fully protected—data is never written to the disk or partition in an unencrypted form. Proper authentication (passphrase, token, or private key) is required to make the files accessible again.

Authenticating at the PGP BootGuard Screen

The PGP BootGuard log-in screen prompts you for the proper passphrase for a protected disk or partition for one of two reasons:

- If your boot disk or partition is protected using PGP Whole Disk Encryption, you must authenticate correctly for your system to start up. This is required because the operating system files that control system startup are encrypted, and must be decrypted before they can be used to start up the system. The PGP Single Sign-On feature also logs into Windows for you, if you chose the SSO option when you first encrypted the boot disk or partition.
- If a secondary fixed disk or partition is protected using PGP Whole Disk Encryption, you can authenticate at startup so that you don't have to authenticate later when you need to use files on the secondary disk or partition. Because the files on the secondary (non-boot) disk or partition are not required for startup, you are not required to authenticate at startup. If you have administrative rights, and your PGP Universal Server policy allows for it, you can use the Bypass feature to skip authentication at startup. You are then asked to authenticate later, when you try to use files on the secondary disk or partition.

Note: The PGP BootGuard log-in screen accepts the authentication information from any user configured for an encrypted disk or partition. For example, if you have two users configured for a boot disk or partition and two different users configured for a secondary fixed disk or partition on the same system, *any* of the four configured users can use their passphrase to authenticate on the PGP BootGuard log-in screen at startup, even the two users configured on the secondary disk or partition.

On the PGP BootGuard log-in screen you can:

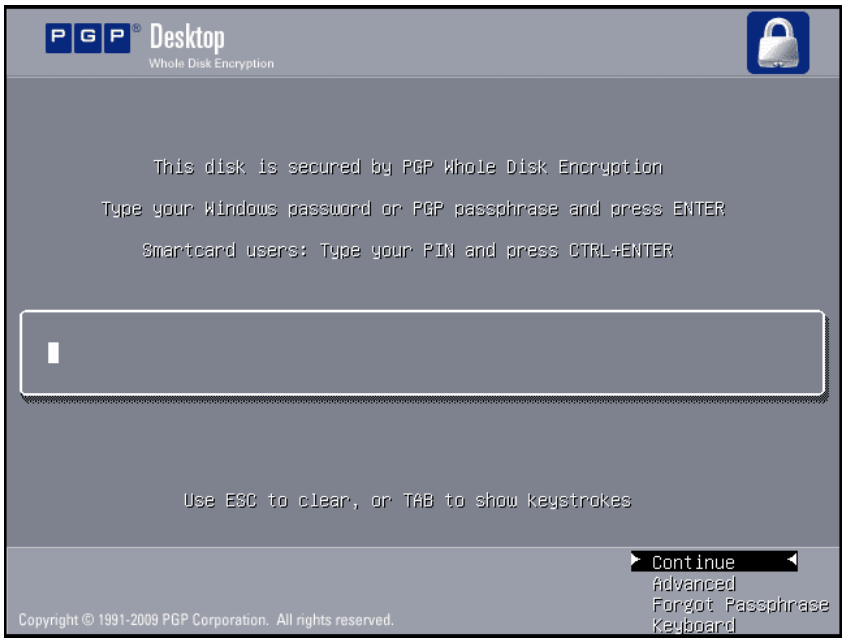
- Authenticate an encrypted boot or secondary disk or partition on the system.
- View information about the disks or partitions on your system and access the Bypass feature (Bypass can be used by users with administrative rights only if PGP Universal Policy allows it).
- Choose your keyboard layout.

If you are using PGP Desktop in a PGP Universal Server-managed environment, your PGP administrator may have customized the PGP Whole Disk Encryption BootGuard screen to include additional text or a custom image such as your organization's logo. The graphics included in this guide depict the default installation. Your actual login screen may look different if your administrator has customized the screen.

To authenticate using the PGP BootGuard log-in screen

1 Start or restart the system that has a disk or partition protected by PGP Whole Disk Encryption. On startup, the PGP BootGuard log-in screen is displayed.

Note: If you are using a USB device for two-factor authentication, be sure the USB device is properly inserted *before* you start or restart your system.


PGP Desktop
Whole Disk Encryption
This disk is secured by PGP Whole Disk Encryption
Type your Windows password or PGP passphrase and press ENTER
Smartcard users: Type your PIN and press CTRL+ENTER
Use ESC to clear, or TAB to show keystrokes
Continue
Advanced
Forgot Passphrase
Keyboard
Copyright © 1991-2009 PGP Corporation. All rights reserved.

2 Type a valid passphrase or Windows password and press **Enter**.

Caution: The PGP BootGuard log-in screen assumes you are using one of the supported keyboard layouts when you type your passphrase. If you used a different keyboard layout to create the passphrase for a disk or partition protected by PGP Whole Disk Encryption, you could have problems authenticating because the mappings between the keyboard layouts may be different. See *Selecting Keyboard Layouts* (on page 163).

To see the characters you type, press **Tab** before you begin typing.

If you make a typing error, or think you might have made a typing error, press **Esc** to clear all characters and start again.

If local self recovery has been configured and you have forgotten your passphrase, select **Forgot Passphrase**. For more information, see *Using Local Self Recovery* (see "If you Forgot Your Passphrase" on page 173).

Note: Token authentication in PGP BootGuard requires pressing Ctrl+Enter instead of just Enter. You may also experience some delay during the authentication of tokens in PGP BootGuard.

3 If you typed a valid passphrase, the PGP BootGuard log-in screen goes away and the system boots normally.

When you first encrypted the boot disk, if you chose to use your Windows Account Logon to authenticate, the PGP Whole Disk Encryption feature logs into Windows for you. You only need to type your passphrase once.

If you typed an invalid passphrase, an error message is displayed. Try typing the passphrase again.

Audible Sounds During Authentication

If you are using PGP Desktop in a PGP Universal Server-managed environment, and your PGP administrator has enabled this option, your system makes audible sounds during PGP BootGuard authentication. There are three different tone pairs to indicate when to enter a passphrase, and the success or failure of authentication.

Each indicator starts with a middle sound and the second sound is higher, the same, or lower.

- When the system is first ready for passphrase/pin entry, the middle-middle (ready) sound is played. When you hear this sound, enter your passphrase and press Enter.
- After you have entered a passphrase, the tones played depend on the success or failure of the passphrase:
  - If passphrase authentication succeeded, the middle-high sound is played. The system then continues booting.
  - If passphrase authentication failed, the middle-low sound is played. The PGP BootGuard authentication screen is displayed and the passphrase field is cleared so you can re-enter your passphrase.

Note that these sounds cannot be customized by your PGP administrator. The administrator can specify only if audible sounds are enabled during PGP BootGuard authentication.

Becoming Locked Out at the PGP BootGuard Screen

If you are using PGP Desktop in a PGP Universal Server-managed environment, your PGP administrator may have specified a PGP BootGuard lockout. You are "locked out" if you exceed the maximum allowed number of passphrase attempts at the PGP BootGuard screen. This applies only to passphrase users (token or TPM users are not affected).

To remove the lockout, please contact your PGP administrator.

Selecting Keyboard Layouts

The PGP Whole Disk Encryption log-in screen supports the following keyboard layouts:

- Belgian (Belgium; Comma)
- Belgian (Belgium; Period)
- Bosnian (Bosnia)
- Bosnian (Bosnia; Cyrillic)
- Bulgarian (Bulgaria)
- Bulgarian (Bulgaria; Latin)
- Bulgarian (Bulgaria; Typewriter)
- Canadian Multilingual Standard (Canada)
- Chinese Simplified (China, Singapore)
- Chinese Traditional (Hong Kong, Taiwan)
- Croatian (Croatia)
- Czech (Czechoslovakia; QWERTY)
- Danish (Denmark)
- Dutch (The Netherlands)
- English (United States)
- English (United Kingdom)
- English (US-International)
- Estonian (Estonia)
- Finnish (Finland)
- French (Belgium)
- French (Canada)
- French (France)
- French (Switzerland)

- German (Germany/Austria)
- German (IBM)
- German (Switzerland)
- Hebrew (Israel)
- Hungarian (Hungary)
- Hungarian (Hungary; 101 keys)
- Icelandic (Iceland)
- Irish (Ireland)
- Italian (Italy)
- Italian (Italy; 142 keys)
- Japanese (Japan)
- Korean (Korea)
- Norwegian (Norway)
- Polish (Poland; Programmers)
- Polish (Poland; 214 keyboard)
- Portuguese (Brazil; ABNT keyboards)
- Portuguese (Brazil; ABNT2 keyboards)
- Portuguese (Portugal)
- Romanian (Romania)
- Russian (Russia; Cyrillic)
- Serbian (Serbia and Montenegro; Cyrillic)
- Serbian (Serbia and Montenegro; Latin)
- Slovak (Slovakia)
- Slovenian (Slovenia)
- Spanish (Spain)
- Spanish (Latin America)
- Spanish Variation
- Swedish (Sweden)
- Turkish (Turkey; F)
- Turkish (Turkey; Q)
- Ukrainian (Ukraine)

Different keyboard layouts can have different mappings between characters, potentially causing problems when you enter your passphrase to authenticate. Select the keyboard layout that most closely maps to the keyboard you are using, then make sure to use that same layout each time you authenticate.

To select a keyboard layout

1. Start or restart the system with the disk or partition protected by PGP Whole Disk Encryption. On startup, the PGP BootGuard log-in screen is displayed.
2. Press the down arrow on your keyboard until **Keyboard** is highlighted.
3. Press **Enter**. The Keyboard layouts screen is displayed.
4. Press **Tab** to move focus to the list of keyboard layouts, then use the up and down arrows on your keyboard to select the desired keyboard layout.
5. Press **Tab** again. The **Go Back** option highlights.
6. Press **Enter**. The PGP BootGuard log-in screen is displayed again.

Using PGP WDE Single Sign-On

Single Sign-On allows you to use your existing Windows passphrase to both authenticate to your PGP WDE-encrypted drive and automatically log you into Windows.

How does Single Sign-On Work?

Single Sign-On utilizes one of the methods Microsoft Windows provides for customizing the Windows login experience. PGP WDE uses your configured authentication information to dynamically create specific registry entries when you attempt to log in.

Note: Your Windows password is *never* stored in the registry, nor in any form on the disk—neither encrypted, nor as cleartext.

Prerequisites for Using Single Sign-On

- You must have PGP Whole Disk Encryption installed.

Local users and Single Sign-On

If a computer is not a member of a domain, PGP Whole Disk Encryption automatically disables certain User Access features when a Single Sign-On user is added to a disk, including 'Use Welcome Screen' and 'Fast User Switching' (which relies on the welcome screen), such that it then makes the Windows Security panel available when using the Ctrl+Alt+Delete key combination.

These features are already automatically disabled if computers are members of a domain.

Encrypting the Disk to Use Single Sign-On

▸ **To encrypt the disk to use Single Sign-On**

1. Click the PGP Disk control box, then select **Encrypt Whole Disk**.
2. Select the disk or partition that you would like to encrypt, and choose the PGP Whole Disk Encryption options that you would like, if any. For information on these options, see *Setting Encryption Options* (on page 148).
3. In the **User Access** section, select **New Passphrase User**.
4. Select **Use Windows Password**, and then click **Next**.
5. Type your Windows login password, and then click **Finish**.

   PGP Whole Disk Encryption verifies that your name is correct across the domain, and that the Windows password is correct. PGP Whole Disk Encryption also checks your password to make sure that it contains only allowable characters. If your password does contain any such characters, you are not allowed to continue. See *Supported Characters for PGP WDE Passphrases* (on page 155) for information on allowable characters.
6. Click **Encrypt**, and then click **OK**.

Multiple Users and Single Sign-On

You can configure up to 28 users for Single Sign-On. PGP Corporation, however, recommends limiting the number of Single Sign-On users to the fewest possible persons who must share the system. While technically feasible to do so, a large number of users sharing a single, encrypted computer is not a secure solution, and PGP Corporation discourages this practice.

Note: The Single Sign-On feature is passphrase-only; you cannot utilize Single Sign-On with users' keys, nor is the feature compatible with smart cards or tokens.

Logging in with Single Sign-On

Once you have configured Single Sign-On, when you start up the system, the PGP BootGuard screen is displayed. If you provide the correct user name and password PGP WDE logs you in to the Windows session and provides access to those disk partitions encrypted with PGP WDE.

Changing Your Passphrase With Single Sign-On

To synchronize your Windows password changes with PGP WDE, you must change your password for Single-Sign On using the **Change Password...** feature in the Windows Security dialog box, which you access by pressing CTRL+ALT+DEL.

To change your passphrase

1. Press Ctrl+Alt+Delete.
2. Type your old password.
3. Type and confirm your new password.
4. Click **OK**.

   Single Sign-On automatically and transparently synchronizes with this new password. You can use the new password immediately, in your next login attempt.

Caution: If you change your password in any other manner—via Domain Controller, the Windows Control Panel, via the system administrator, or from another system—your next login attempt on the PGP BootGuard screen will fail. You must then supply your old Windows password. Successful login on the PGP BootGuard screen using your old Windows password then brings up the Windows Login username/password screen. You must then log in successfully using your new Windows password, at which time PGP WDE will synchronize with the new password.

Displaying the Windows Login dialog box

When using PGP WDE with SSO, once you have successfully entered your passphrase at the PGP BootGuard, you are automatically logged in to your computer. As soon as Windows has started up, your Windows desktop is displayed.

However, there may be times when you need to log in to your system using the Windows Login dialog box, rather than automatically logging in. For example, you may need to access certain network dialog boxes, such as your corporate VPN, that might be bypassed using SSO.

To skip PGP WDE SSO login and display the Windows Login

1. Log in to your computer at the PGP BootGuard screen as usual by entering your passphrase and pressing Enter.
2. When the Microsoft Windows splash screen is displayed, press and hold the Shift key until the Windows Login dialog box is displayed. Note that you can press the Shift key when the splash screen is about halfway through the Windows boot process.

3 When the Windows Login dialog box is displayed, enter the information to log in to your system.

Maintaining the Security of Your Disk

The following sections describe how to work with your disk once you have encrypted it with PGP WDE.

Getting Disk or Partition Information

▸ **To see read-only disk or partition information on the Advanced PGP BootGuard log-in screen**

1 Start or restart the system that has a disk or partition protected using PGP Whole Disk Encryption. On startup, the PGP BootGuard log-in screen is displayed.

2 Press the down-facing arrow on your keyboard. In the lower right corner, **Advanced** highlights.

3 Press **Enter**. The Advanced PGP BootGuard log-in screen is displayed.

This screen displays the following information:

- All disks or partitions on the system, including the encryption status of disks or partitions protected using PGP Whole Disk Encryption.
- The computer name.
- The computer ID.
- The disk or partition that is currently selected, and whether the Bypass feature is available for the selected disk or partition. (The Bypass feature can be used only by users with administrative rights on the system and if your PGP Universal Server policy allows it.)

4 To return to the PGP BootGuard log-in screen, highlight **Go Back** in the lower right corner of the screen, then press **Enter**.

Modifying the System Partition

Do not make any changes to the system partition on a boot disk that has been encrypted by PGP WDE; it will fail to boot properly on the next startup. If you must make changes to the partitioning of an encrypted disk, decrypt the disk first and then make the partition changes.

Using the Bypass Feature

Note: This feature is available only for users who have administrative rights on the system and your PGP Universal Server policy allows it.

With the Bypass feature, you can skip authentication at startup. If your boot disk or partition is not protected using PGP Whole Disk Encryption, but a different fixed disk or partition on your system is, the PGP BootGuard log-in screen is displayed at startup. You can use the Bypass feature to skip authentication so the boot disk or partition can start up.

Caution: You can use the Bypass feature only if your boot disk or partition is *not* protected using PGP Whole Disk Encryption. If your boot disk or partition is protected and you do not authenticate, the operating system does not load and the computer does not boot.

To use the Bypass feature

1. Start or restart the system with the disk or partition protected using PGP Whole Disk Encryption. On startup, the PGP BootGuard log-in screen is displayed.
2. Press the down arrow on your keyboard. In the lower right corner, Advanced highlights.
3. Press **Enter**. The Advanced PGP BootGuard log-in screen is displayed.
4. Press the down arrow on your keyboard again. In the lower right corner, **Bypass** highlights.
5. Press **Enter**. The PGP BootGuard Advanced log-in screen stops displaying, and the system boots normally.

Adding Other Users to an Encrypted Disk or Partition

The user who creates an encrypted disk or partition can make it available to others. These additional users can access the encrypted disk or partition using their own unique passphrase, private key, or token (including PIV cards). You can have up to 120 users per encrypted disk.

To determine what type of user is associated with the encrypted disk, move your cursor over the user's name in the User Access list. A "hint" is displayed showing the type of user. A token key icon is used to indicate a token user and the Windows Domain/User Name is displayed for an SSO user.

Caution: Having multiple users who can access a disk or partition protected by PGP Whole Disk Encryption serves as a backup in case one person forgets their passphrase or loses their authentication token. Users configured for an encrypted disk or partition can authenticate to the PGP Whole Disk Encryption log-in screen to unlock any protected disk or partition on that system.

To add additional users to a disk or partition protected by PGP Whole Disk Encryption

1. Click the PGP Disk Control box on the left pane of the PGP Desktop main screen.
2. Select the encrypted disk or partition to which you want to add another user in the list of disks at the top of the PGP Disk Work area.
3. Click **New Passphrase User**. The Select User Type dialog box is displayed.
4. Follow the instructions provided in the User Access step in *Encrypting the Disk* (on page 156).

Note: Public key encryption is the most secure protection method when adding other users to disks or partitions encrypted with PGP Whole Disk Encryption because: (1) There is no need to reveal passphrases to new users, so the risk of passphrases being intercepted or overheard is minimal. (2) Other users do not need to memorize another passphrase. (3) It is easier to manage lists of users if each uses their own private key to access the disk. If you are protecting a boot disk or partition with PGP Whole Disk Encryption, the public key must be on a token.

Deleting Users From an Encrypted Disk or Partition

At some point you may want to remove the ability of a user to access an encrypted disk or partition.

To remove a user from an encrypted disk or partition

1. On the Encrypt Whole Disk (Partition) screen, select the appropriate disk or partition protected by PGP Whole Disk Encryption.
2. From the **User Access** list, select the name of the user you want to remove.
3. Click **Delete User**. The Passphrase dialog box is displayed, prompting you to authenticate.
4. Type a valid passphrase, then click OK. The alternate user is removed.

Changing User Passphrases

If you are using Single Sign-On, change your password as described in *Changing Your Passphrase when the Single Sign-On Feature is Used* (on page 171).

To change user passphrases on an encrypted disk or partition

1. On the Encrypt Whole Disk (Partition) screen, select the appropriate disk or partition protected by PGP Whole Disk Encryption.
2. In the **User Access** list, select the name of the user whose passphrase you want to change.
3. Click **Change Passphrase**. You are prompted to type the current passphrase.
4. Type the appropriate passphrase, then click **OK**. The Change User Passphrase dialog box is displayed.
5. Type a new passphrase.
6. In the Confirm Passphrase field, type the new passphrase again, then click **OK**. The passphrase is changed.

   The Passphrase Quality bar provides a basic guideline for the strength of the passphrase you are creating. For more information, see *The Passphrase Quality Bar* (on page 304).

   Normally, as an added level of security, the characters you type for a passphrase are not visible on the screen. If you would like to see the characters of your passphrase as you type, select the **Show Keystrokes** check box.

Changing Your Passphrase when the Single Sign-On Feature is Used

If you opt for the PGP Whole Disk Encryption Single Sign-On feature, it is recommended that you change your passphrase using the **Change Password** feature in the Windows Security dialog box.

Note: You can access the Windows Security dialog box by pressing **CTRL+ALT+DEL**.

To change your passphrase while using the Single Sign-On feature

1. Press Ctrl+Alt+Delete. The Windows Security dialog box is displayed.
2. Type your old passphrase.
3. Type and confirm your new passphrase.
4. Click **OK**. Your Windows password and PGP Whole Disk Encryption passphrase are changed together. Use the new passphrase during your next login attempt.

Caution: If you change your passphrase in any manner other than the one described here, your next login attempt on the PGP BootGuard screen will fail. You must then supply your old passphrase. Successful login on the PGP BootGuard screen using your old passphrase then brings up the Windows Login username/password screen. You must then log in successfully using the Windows Login screen, at which time the PGP Whole Disk Encryption feature will synchronize with the new passphrase.

Local users and the PGP Whole Disk Encryption Single Sign-On Feature

If a computer is not a member of a domain, PGP Whole Disk Encryption automatically ensures that users must sign in using Ctrl+Alt+Delete. It does that by disabling certain Windows user access features, including the **Use Welcome Screen** and Ctrl+Alt+Delete options after a Single Sign-On user has been added.

These features are automatically disabled when a computer is member of a domain.

Re-Encrypting an Encrypted Disk or Partition

Consider re-encrypting a protected disk or partition that you suspect of having a passphrase or authentication token that has been compromised, or if users have been removed who previously had access.

To re-encrypt a disk or partition, the PGP Whole Disk Encryption feature uses the same encryption algorithm (AES256)—but a different underlying encryption key—to encrypt the disk or partition again. The result is as if you decrypted the disk or partition and encrypted it again, but much faster.

Note: Re-encryption applies to all partitions that are already encrypted. Selecting one partition to encrypt implies all partitions on the same disk that are already encrypted would be re-encrypted one by one.

To re-encrypt an encrypted disk or partition

1. Select the appropriate encrypted disk or partition.
2. Select **Disk > Re-Encrypt**. You are prompted to authenticate.
3. Type the appropriate passphrase, then click **OK**. The re-encryption process begins.

If you Forgot Your Passphrase

If you forgot your passphrase, and if your system is configured for it, you can bypass PGP BootGuard by answering three out of five security questions correctly.You create and answer the five security questions. This is similar to recovering your key if you lost the key or forgot the passphrase for the key.

Note: If you are using PGP Desktop in a PGP Universal Server-managed environment, your PGP Universal Server administrator may have disabled the option for local self recovery. Your administrator may also have specified that local self recovery be configured during enrollment. In this case, you are prompted to enter the security questions as you set up PGP Desktop.

To create your security questions

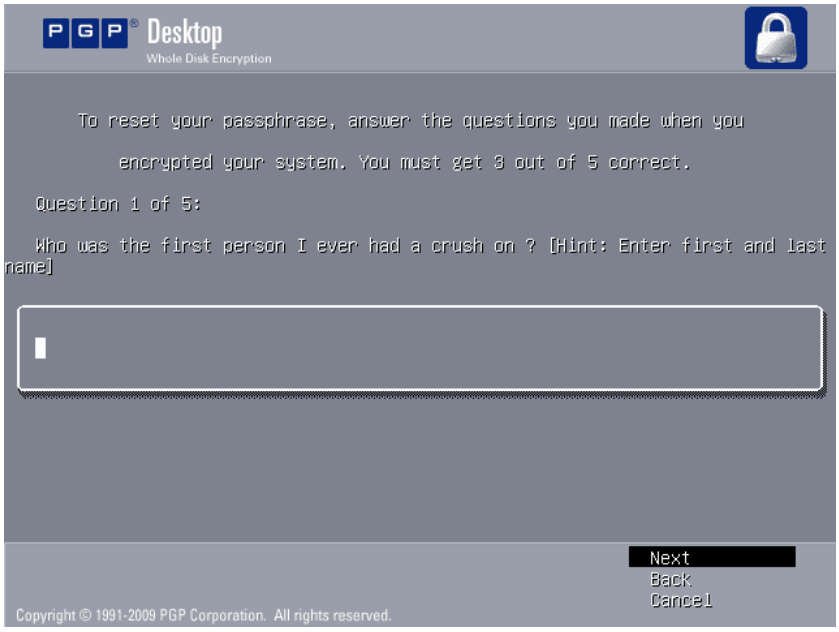
1. Using PGP Desktop, encrypt your internal drive. You can use either a Passphrase user or a Windows SSO user.
2. Right-click the user's name in PGP Desktop and select **Add Security Questions**.

   Note: You cannot create security questions for the WDE-Admin user or the ADK.
3. Create and answer the five security questions. The user's name is displayed with **LSR** to the right (and a tool tip), to indicate that "local self recovery" has been configured for the user.

To recover your passphrase at PGP BootGuard

1. At the PGP BootGuard screen, use the arrow keys to select **Forgot Passphrase** and press Enter.

2 Answer the first security question displayed. Type the answer and press Enter.


PGP Desktop
Whole Disk Encryption
To reset your passphrase, answer the questions you made when you encrypted your system. You must get 3 out of 5 correct.
Question 1 of 5:
Who was the first person I ever had a crush on ? [Hint: Enter first and last name]
Next
Back
Cancel
Copyright © 1991-2009 PGP Corporation. All rights reserved.

3 Continue to answer the questions. You must answer three of the five questions correctly.

4 When you have answered the questions correctly, the Windows operating system begins to start up. When the Log On to Windows dialog box is displayed, enter your Windows login name and password.

When Windows has finished launching, the PGP Disk - Change User Passphrase dialog box is displayed.

5 Enter and confirm a new passphrase for the user, and click **OK**. The new passphrase is created for the user.

The Passphrase Quality bar provides a basic guideline for the strength of the passphrase you are creating. For more information, see *The Passphrase Quality Bar* (on page 304).

Normally, as an added level of security, the characters you type for a passphrase are not visible on the screen. If you would like to see the characters of your passphrase as you type, select the **Show Keystrokes** check box.

The same security questions are displayed if you forget your passphrase again. If you want to change your security questions, right-click the user name and select **Create Security Questions**.

Backing Up and Restoring

While most modern backup programs have no problem backing up the data on a PGP WDE-encrypted disk, some other backup programs do have problems with it. These other backup programs fail when they encounter the file PGPWDE01, a file used by PGP WDE. The solution is to have these programs exclude PGPWDE01 from the backup (most backup programs let you exclude individual files). Once you get your backups working again with these programs, it is a good idea to test the backup to make sure it works.

Using Automatic Backup Software on a PGP WDE-Encrypted Disk

You can automatically back up the disk or partition once protected with PGP WDE. Be sure to back up your system first before you encrypt it with PGP WDE.

It is important to note that any files the software backs up are decrypted before being backed up. To back up encrypted data, use a PGP Virtual Disk or PGP NetShare protected folders.

Uninstalling PGP Desktop from Encrypted Disks or Partitions

If you have any disks or partitions on your system that are protected by PGP Whole Disk Encryption, these disks or partitions become inaccessible once PGP Desktop is uninstalled. For that reason, a safety feature prevents you from uninstalling PGP Desktop if your system has any disks or partitions protected by PGP Whole Disk Encryption. In this instance you see an error message explaining that the uninstall process is being terminated to protect the encrypted disk or partition.

If you want to uninstall PGP Desktop, first decrypt any disks or partitions on your system that are protected using PGP Whole Disk Encryption.

Working with Removable Disks

This section describes how to work with removable disks. If you are using PGP Whole Disk Encryption in a PGP Universal Server-managed environment, your security policy may require that removable disks be encrypted. Your security policy may also require that removable disks be mounted as read-only disks, but an option is provided for you to encrypt the disk.

Caution: Always use the Microsoft Windows **Safely Remove Hardware** option to stop attached USB devices before removing them.

Encrypting Removable Disks

If you are using PGP Whole Disk Encryption in a PGP Universal Server-managed environment, your security policy may require that removable disks be encrypted. When you insert the removable disk, the PGP Desktop Storage Device Connected dialog box is displayed.

Do one of the following:

- If the removable disk is an external drive, such as a USB flash disk or external hard drive, click **Encrypt**. The device is automatically encrypted to your key. Note that if your boot disk is encrypted with other users' keys, they are added as users to your removable disk. If your key cannot be found, or if other users' keys cannot be found, then you are prompted to create a passphrase user.

  Note: If your PGP Universal Server administrator has specified all removable disks be encrypted automatically, and your boot disk is not encrypted, the first keypair on user's keyring is used for encrypting the device.

  Depending on the size of the disk, it may take some time for the encryption process to complete. While the disk is being encrypted you can continue to use the removable disk.

  Warning: Be sure the encryption process has completed before you remove the disk.

- If you do not want to encrypt the device, click **Lock**. The device will be locked and will be read-only. If you attempt to modify or delete any files from the device, a Windows error message will appear.

  If the removable disk is a music device or digital camera, click **Lock**. These types of devices will not work if the contents of the device are encrypted. If you accidentally encrypt a music device or digital camera, you will need to decrypt it. Depending on your corporate security policy you may need to contact your IT department or PGP administrator for help with decrypting this device.

If your security policy requires that all removable disks be encrypted and the PGP Universal Server is not available (for example, if you are on an airplane and not connected to your corporate network), the removable device cannot be encrypted. Therefore, the device will be "locked" and will be read-only. The next time you connect to the PGP Universal Server, you will be able to encrypt the contents of the disk (if it has not already been encrypted).

Note: When your PGP Administrator has specified that all removable disks be encrypted, the option to **Exit PGP Services** is no longer available from the PGP tray menu.

Using Locked (Read-Only) Disks as Read-Only

If you are using PGP Whole Disk Encryption in a PGP Universal Server-managed environment, your security policy may require that removable disks be mounted as read-only devices. When you insert the removable disk, the PGP Desktop Storage Device Connected dialog box is displayed. The removable disk is locked, and you cannot write data to the disk until you encrypt it. If you choose to encrypt the device, you can continue to use the disk as normal.

Do one of the following:

- If the removable disk is an external drive, such as a USB flash disk or external hard drive, and you want to be able to write to the disk, click **Encrypt**. The device is automatically encrypted to your key. Note that if your boot disk is encrypted with other users' keys, they are added as users to your removable disk. If your key cannot be found, or if other users' keys cannot be found, then you are prompted to create a passphrase user.

  Depending on the size of the disk, it may take some time for the encryption process to complete. While the disk is being encrypted you can continue to use the removable disk.

  Warning: Be sure the encryption process has completed before you remove the disk.

- If you do not want to encrypt the device, click **Lock**. The device will be locked and will be read-only. If you attempt to modify or delete any files from the device, a Windows error message will appear.

  If the removable disk is a music device or digital camera, click **Lock**. These types of devices will not work if the contents of the device are encrypted. If you accidentally encrypt a music device or digital camera, you will need to decrypt it. Depending on your corporate security policy you may need to contact your IT department or PGP administrator for help with decrypting this device.

Moving Removable Disks to Other Systems

If you use PGP Whole Disk Encryption to protect a removable disk—a USB flash disk, for example—you can move that disk to another Windows or Mac OS X system and access the encrypted files on that flash disk on the other system. Removable disks created using PGP WDE on Linux can be accessed using PGP Desktop version 10.0 or later.

You will need to be able to authenticate to access the contents of the disk.

Note: Consider PGP Desktop licensing when moving an encrypted, removable disk. To protect a disk using the PGP Whole Disk Encryption feature, you must have the appropriate PGP Desktop license. However, if you have protected a removable disk with PGP Whole Disk Encryption, you can use that removable disk on another computer with PGP Desktop 9.5.2 or later installed—even if the other system does not have a PGP Desktop license that supports Whole Disk Encryption.

Reformatting an Encrypted Removable Disk

If you have encrypted a removable disk and then used the Windows Disk Management utility to reformat it, the next time you insert the disk you are prompted to enter the passphrase.

In order to remove this requirement, do the following:

1. Start a command prompt (**Start > Run**, and enter `cmd`) and navigate to `C:\Program Files\PGP Corporation\PGP Desktop`.
2. Enter the following command:

   ```
   pgpwde --fixmbr --disk 1
   ```

   If you have more than one encrypted disk on your system, you may need to run the `pgpwde --enum` command first. This command lists your encrypted disks. If the command returns information that your USB drive is not disk "1", use that number instead (for example, if your USB disk is disk "2", enter the command to remove encryption as `pgpwde --fixmbr --disk 2` .

You will no longer be prompted for the passphrase when you insert the disk.

Using PGP WDE in a PGP Universal Server-Managed Environment

The PGP Whole Disk Encryption feature can be administered for PGP Desktop users in a PGP Universal Server-managed environment. Administrators can deploy PGP Desktop installers to users throughout their enterprise.

PGP Whole Disk Encryption Administration

The PGP administrator can control:

- **Whether or not the PGP Whole Disk Encryption feature is available to users**. If you are in a PGP Universal Server-managed environment and the PGP Whole Disk Encryption feature is *not* available, check with your PGP administrator to see if the feature has been disabled by policy.

The PGP Whole Disk Encryption feature also requires an appropriate license from PGP Corporation. If the feature is disabled for you, even though it is enabled by policy, check with your PGP administrator to make sure you have an appropriate license.

- **Whether or not you can recover disks or partitions that are protected with PGP Whole Disk Encryption**. If you forget the passphrase to a disk or partition encrypted with PGP Whole Disk Encryption, or if you lose the authentication token, the disk or partition is not accessible. However, if you are using the PGP Whole Disk Encryption feature in a PGP Universal Server-managed environment, check with your PGP administrator to see if disk or partition recovery is an available option.
- **Whether or not your boot disk must be encrypted with PGP Whole Disk Encryption when you install PGP Desktop**.

  If you are using PGP Desktop in a PGP Universal Server-managed environment, contact your PGP administrator for more information.
- **Whether or not your computer uses the PGP Whole Disk Encryption Single Sign-on (SSO) feature**.

  For more information on this feature, see *Using PGP WDE Single Sign-On* (on page 165).
- **What modes you can use with the PGP Whole Disk Encryption feature**.
- **Whether or not your PGP administrator can use an administrator key (with a smart card) to access your encrypted disk or partition.**

For more information on encryption modes, see *Determine the Authentication Method for the Disk* (see "Determining the Authentication Method for the Disk" on page 145).

If you are using PGP Desktop in a PGP Universal Server-managed environment, after installing PGP Desktop, you may be required to encrypt your boot disk or partition using the PGP WDE feature. Conversely, the PGP WDE feature may be disabled by your PGP administrator.

If you are using PGP Desktop in a PGP Universal Server-managed environment, you may be prompted to encrypt a removable disk when it is inserted. For more information, see *Encrypting Removable Disks* (on page 176).

If your policy should change from one to the other, specifically from having the ability to encrypt a disk to having that feature disabled, note that you are still able to use any drives that are already whole disk encrypted. You will not, however, be able to encrypt any more drives, re-encrypt existing encrypted drives, or add new users.

For more information, see *Using PGP Desktop with PGP Universal Server* (on page 309).

Creating a Recovery Token

If you are working within a PGP Universal Server-managed environment, and the policy that applies to you allows for the creation of whole disk recovery tokens, then PGP Desktop creates a recovery token whenever you encrypt a disk, partition (on Windows systems), or removable disk with PGP Whole Disk Encryption. This recovery token can be used to access the disk or partition (on Windows systems) in case the passphrase or authentication token (on Windows systems) is lost.

If the policy that applies to you does not support it, or if you are not in a PGP Universal Server-managed environment with a pre-configured installation of PGP Desktop, you will not be able to use whole disk recovery tokens.

This recovery token is automatically sent to the PGP Universal Server managing security for the disk or partition (on Windows systems) protected by PGP Whole Disk Encryption.

If you are in a PGP Universal Server-managed environment, and you lose the passphrase or authentication token used to protect a disk or partition (on Windows systems) with PGP Whole Disk Encryption, you should contact your PGP administrator for assistance using the recovery token.

The recovery token can be used only once to gain access to a disk or partition (on Windows systems) that has been protected using PGP Whole Disk Encryption. After a recovery token is used, a new one is generated automatically and sent to the PGP Universal server. The PGP Desktop user is given the option of creating a new user, or keeping the existing one(s) on the disk or partition.

Note that the recovery token is used only to gain access to an encrypted disk or partition (on Windows systems). You cannot use the recovery token to encrypt or decrypt data.

Caution: Consider re-encrypting disks or partitions (on Windows systems) protected by PGP Whole Disk Encryption if security is compromised, by passphrase exposure for example, or loss of the authentication token (on Windows systems). This process re-encrypts the disk or partition with the same encryption algorithm, but with a different underlying encryption key. The result is as if you decrypted the disk or partition and encrypted it again, but is much faster.

Using a Recovery Token

Once you have received the recovery token from your PGP Universal Administrator, follow the steps below to unlock your disk.

When you enter a recovery token, you do not need to match the case (all uppercase) or dashes that you received from your PGP Universal Administrator. You can enter all lowercase characters without the dashes if you want.

To use a recovery token on a boot disk

- At the PGP BootGuard screen, enter the recovery token in the passphrase field.

To use a recovery token on a removable drive

- Insert the disk and enter the recovery token when prompted to enter the passphrase.

Recovering Data From an Encrypted Drive

Although rare, you may find it necessary to recover data from an encrypted drive that has been damaged or corrupted. Or, you may find that you do not have the login information in order to access a drive (such as a former employee's encrypted drive). In these cases, there are several things you can do:

1. Use a recovery disk. If a recovery disk was created before the disk or partition was encrypted, you can use it to decrypt the disk. For more information, see *Creating and Using Recovery Disks* (on page 181).
2. Use another system to decrypt the drive. For more information, see *Decrypting a PGP WDE-Encrypted Disk* (on page 183).
3. Use the Whole Disk Recovery Token. If you are using PGP Desktop in a PGP Universal Server-managed environment, the recovery token is created automatically when the disk is encrypted. For more information, see *Using a Recovery Token* (on page 180).

Creating and Using Recovery Disks

While the chances are extremely low that a master boot record could become corrupt on a boot disk or partition protected by PGP Whole Disk Encryption, it is possible. If it happens, it could prevent your system from booting.

Be safe: prepare for this highly unlikely event by creating a recovery CD or diskette—or both—**before** you encrypt a boot disk or partition using PGP Whole Disk Encryption.

Caution: Note that recovery disks work only with the version of PGP Desktop that created the recovery disk. For example, if you attempt to use a 9.0.x recovery disk to decrypt a disk protected with PGP WDE 9.5 software, it will render the PGP WDE 9.5 disk inoperable.

This section includes procedures for creating both a recovery compact disc and a diskette. It also discusses their use.

To create a recovery CD

1. Make sure PGP Desktop for Windows and Roxio Easy Media Creator or Roxio Easy CD Creator (or other software that can create a CD from an ISO image) are installed on your system.
2. Open Roxio Easy Media Creator or Roxio Easy CD Creator and choose to create a Data CD Project.
3. Select **File > Record CD from CD Image**. The Record CD from Hard Disk Image screen is displayed.
4. Select **Files of Type > ISO Image Files (ISO)**.
5. Navigate to the PGP directory. The default directory is `C:\Program Files\PGP Corporation\PGP Desktop\`.
6. Select `bootg.iso` and click **Open**. The Record CD Setup screen is displayed.
7. Insert a blank, recordable CD into a CD drive on your system.
8. On the Record CD Setup screen, click **Start Recording**. The Record CD from CD Image Progress screen is displayed as the ISO file is burned to the CD.
9. When the file is burned to the CD, click **OK**. The PGP Whole Disk Encryption recovery CD is ready.
10. Remove the recovery CD from the drive and label it appropriately.

To create a recovery diskette

1. Make sure PGP Desktop for Windows and an application that can create a recovery diskette (such as MagicISO) are installed on your system.
2. Insert a blank diskette into the disk drive.
3. Open MagicISO.
4. Select **Tools > Write Floppy Disk Image**. The Open dialog box is displayed.
5. Navigate to the PGP directory. The default directory is `C:\Program Files\PGP Corporation\PGP Desktop\`.
6. Select `Bootg.img`, then click **Open**. The file is written to the diskette.
7. Remove the recovery diskette from the drive and label it appropriately.
8. Exit from MagicISO.

To use a recovery disc or diskette

Caution: Once you have started to decrypt a disk or partition using a recovery disc or diskette, do not stop the decryption process. Depending on the size of the disk being decrypted, this process can take a long time. A faster way to decrypt the drive is to use another system that has the same version of PGP Desktop installed on it. For more information, see *Decrypting a PGP WDE-Encrypted Disk* (on page 183).

1. If the PGP Whole Disk Recovery log-in screen does not appear when you restart your system, or on restart you are prompted for a PGP Whole Disk Encryption recovery disk, insert the recovery CD into a CD drive on the system or the recovery diskette into the disk drive.
2. Restart the system. The PGP Whole Disk Encryption log-in screen from the recovery disk is displayed.
3. Type an appropriate passphrase for the boot drive or partition that is protected by PGP Whole Disk Encryption. You can:
   - Press **Enter** to attempt to boot the system.
   - Type `D` to decrypt the disk.

Decrypting a PGP WDE-Encrypted Disk

As a best practice, if you need to perform any disk recovery activities on a disk protected with PGP Whole Disk Encryption, PGP Corporation recommends that you first decrypt the disk. Decrypt a disk by doing one of the following:

- Use the PGP Desktop **Disk > Decrypt** option (see the following procedure for information on how to use this option to decrypt a disk).
- Use your prepared PGP WDE Recovery Disk (see *Creating Recovery Disks* (see "Creating and Using Recovery Disks" on page 181) for information on how to create a recovery disk).
- Connect the hard disk via a USB cable to a second system and decrypt from that system's PGP Desktop software.

Once the disk is decrypted, proceed with your recovery activities.

To use PGP Desktop to decrypt a disk

1. Open PGP Desktop and click on the PGP Disk Control box. The PGP Disk Control box highlights.
2. Click **Encrypt Whole Disk or Partition**. The Encrypt Whole Disk (Partition) work area displays, and you see a listing of the disks on your system that can be protected by PGP Whole Disk Encryption: disks, disk partitions, removable media, and so on.

3 In the **Encrypt Whole Disk (Partition)** work area, in the **Select disk or partition to encrypt** section at the top, click to select the disk or partition on your computer that you want to decrypt.

4 Select **Disk** > **Decrypt** or click **Decrypt**. The Unlock Disk dialog box is displayed.

5 Enter the passphrase to unlock the disk. The Decryption Progress displays in the PGP Desktop window.4

The time it will take to decrypt the disk is also displayed in the PGP Desktop window. To pause or cancel the decryption process, click **Stop**. If necessary, you can shut down the computer by choosing **Start** > **Shut Down**. *Do not power down the system by depressing the power on/off button*.

To use another system to decrypt a PGP WDE-encrypted drive

1 Remove the hard drive you want to decrypt from the computer and place it in a drive enclosure.

2 Connect a USB cable from the drive enclosure to a computer that has PGP Desktop installed on it.

3 On the computer that has PGP Desktop installed, at the prompt enter the passphrase to decrypt the drive that is located in the drive enclosure.

Special Security Precautions Taken by PGP Desktop

PGP Desktop has features that help avoid security problems with the PGP Whole Disk Encryption feature. These precautions also apply to PGP Virtual Disk volumes.

Passphrase Erasure

When you enter a passphrase, PGP Desktop uses it only for a brief time, then erases it from memory. PGP Desktop also avoids making copies of the passphrase. The result is that your passphrase typically remains in memory for only a fraction of a second. Without this critically important feature, someone could search for your passphrase in your computer memory while you were away from the system. You would not know it, but they would then have full access to data protected by this passphrase.

Virtual Memory Protection

Your passphrase or other keys could be written to disk as part of the virtual memory system swapping memory to disk. PGP Desktop takes care that the passphrases and keys are never written to disk. This feature prevents a potential intruder from scanning the virtual memory file looking for passphrases.

Hibernation vs Standby

In Windows, Hibernate mode writes an image of your computer's entire main memory storage to a file on your hard drive, but *not* your passphrase. PGP Corporation recommends that you always use Hibernate, rather than Standby, as Hibernate turns your computer off and then requires that you authenticate at the PGP BootGuard screen to log in again.

Memory Static Ion Migration Protection

When you protect a disk or partition (on Windows systems) with PGP Whole Disk Encryption, your passphrase is turned into a key. This key is used to encrypt and decrypt the data on the encrypted disk or partition. While the passphrase is erased from memory immediately, the key (from which your passphrase cannot be derived) remains in memory.

This key is protected from virtual memory; however, if a certain section of memory stores the exact same data for extremely long periods of time without being turned off or reset, that memory tends to retain a static charge, which could be read by attackers. If your encrypted disk or partition (on Windows systems) is decrypted for long periods, over time, detectable traces of your key could be retained in memory. Devices exist that could recover the key. You won't find such devices at your neighborhood electronics shop, but major governments are likely to have a few.

PGP Desktop protects against this by keeping two copies of the key in RAM, one normal copy and one bit-inverted copy, and inverting both copies every few seconds.

Other Security Considerations

In general, the ability to protect your data depends on the precautions you take, and no encryption program can protect you from sloppy security practices. For instance, if you leave your computer on with sensitive files open when you leave your desk, anyone can access that information—even if the disk or partition (on Windows systems) is protected using PGP Whole Disk Encryption.

Here are some tips for maintaining optimal security:

- When you are away from your desk, use a screen saver with a password to deter others from accessing your computer or viewing your screen.

- Make sure that your encrypted disks or partitions (on Windows systems) are not available to other computers on a network. You may need to arrange this with the network management staff within your organization. Once you have unlocked your disk or partition, PGP Whole Disk Encryption can no longer protect the files. They can be seen by anyone with network access to them. Consider the PGP Virtual Disk feature for storing files that need to be locked even while you are using your computer.
- Never write down your passphrase. Pick something you can remember. If you have trouble remembering your passphrase, use something to jog your memory, such as a poster, a song, a poem, or a joke—just *do not write it down*.
- If you use PGP Desktop at home and share your computer with other people, they will probably be able to see your open files on a disk or partition (on Windows systems) that is protected using PGP Whole Disk Encryption. As long as you shut down a system with a whole disk encrypted disk or partition, or if you remove an encrypted removable disk from the system, all files on the disk or partition remain encrypted and fully protected.

Using the Windows Preinstallation Environment

Creating a customized Windows Preinstallation (PE) CD/UFD (USB Flash Drive) provides a bootable recovery tool that can be used for rescue purposes. For example, you can use the DOS commands to copy, edit, backup and delete files.

Also use Windows PE to upgrade a PGP WDE-encrypted computer to Windows Vista.

To obtain the PGP WDE drivers and tools, see the PGP Support *Knowledgebase Article 807* (https://support.pgp.com/?faq=807). Also included in this KB article is a technical note you can download that contains all of the instructions in this section.

Using PGP Whole Disk Encryption with IBM Lenovo ThinkPad Systems

Use the Windows Preinstallation Environment (PE) to pre-install the PGP WDE driver into IBM Lenovo ThinkPad Rescue and Recovery and automatically detect the Lenovo Rescue and Recovery feature.

This option is available only for IBM Lenovo systems running Rescue and Recovery version 3.0 and later. This option pre-installs the PGP WDE driver into Lenovo Rescue and Recovery and automatically detects the Lenovo Rescue and Recovery support. It picks up the PGP WDE driver from the \windows\system32\drivers directory. The two files installed into the IBM Lenovo Rescue and Recovery are the PGP WDE driver (`pgpwded.sys`) and the `PGPstart.exe` file (for more information on this file, see the following procedure).

The files that are required to install PGP Whole Disk Encryption into IBM Lenovo Rescue and Recovery are:

- Files from pgppe tool: `pgppe.exe`, `pgpstart.exe`
- Files from PGP Desktop installation: `pgpwded.sys`, `pgpbootb.bin`, `pgpbootg.bin`, `pgpsdk.dll`, `pgpsdknl.dll`, `pgpwd.dll`, `pgpwde.exe`
- Files for Windows Vista only: wimfltr drivers need to be installed (this is part of the Windows Automated Installation Kit)

Caution: Use this option only after PGP Desktop is installed on the system.

To enable Lenovo Rescue and Recovery

1. Install PGP Desktop.
2. Obtain and install the Windows Preinstallation Environment tools from the *PGP Support Knowledgebase Article 807* (https://support.pgp.com/?faq=807).
3. Copy the `PGPstart.exe` and `PGPpe.exe` files from the zipped file into your PGP Desktop installation directory (usually, `c:\Program Files\PGP Corporation\PGP Desktop`).
4. Start a command prompt and change to your PGP Desktop directory.
5. Run the pgppe command as follows:

   ```
   pgppe /recovery
   ```

To remove Lenovo Rescue and Recovery support

Run the pgppe command as follows: `pgppe /recovery /remove`

Using PGP Whole Disk Encryption with the Microsoft Windows XP Recovery Console

If you use the Windows XP Recovery Console for administration purposes, you must install the PGP WDE drivers to the Microsoft Windows Recovery Console when the disk is encrypted otherwise the Recovery Console can not be used.

Note: To authenticate users using Windows PE or BartPE, you must use passphrase users. Token or TPM users are not supported.

Caution: Install these drivers after PGP Desktop is installed and the disk encrypted with PGP WDE.

To install PGP WDE drivers to the Windows XP Recovery Console

1. Install PGP Desktop.
2. Obtain and install the Windows Preinstallation Environment tools from the *PGP Support Knowledgebase Article 807* (https://support.pgp.com/?faq=807).
3. Copy the `PGPstart.exe` and `PGPpe.exe` files from the zipped file into your PGP Desktop installation directory (usually, `c:\Program Files\PGP Corporation\PGP Desktop`).
4. Start a command prompt and change to your PGP Desktop installation directory.
5. Run the pgppe command as follows:

   ```
   pgppe /cmdcons
   ```

To remove drivers from the Windows XP Recovery Console

Run the pgppe command as follows: `pgppe /cmdcons /remove`

11 Using PGP Virtual Disks

Use PGP Virtual Disks to organize your work, keep similarly named files separate, or keep multiple versions of the same documents or programs separate.

This section describes the PGP Virtual Disk feature of PGP Desktop.

Note: If you are using PGP Desktop in a PGP Universal Server-managed environment, your PGP Universal Server administrator may have disabled certain features. When a feature is disabled, the control item in the left side is not displayed and the menu and other options for that feature are not available. The graphics included in this guide depict the default installation with all features enabled. If your PGP Universal Server administrator has disabled this functionality, this section does not apply to you.

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Note: PGP Virtual Disks were called *PGP Disks* in previous versions of PGP Desktop. The phrase *PGP Disk* now includes both the PGP Virtual Disk and the PGP Whole Disk Encryption features.

About PGP Virtual Disks

A PGP Virtual Disk is an area of space, on any disk connected to your computer, which is set aside and encrypted. PGP Virtual Disks are much like a bank vault, and are very useful for protecting sensitive files while the rest of your computer is unlocked for work.

A PGP Virtual Disk looks and acts like an additional hard disk, although it is actually a single file that can reside on any of your computer disks. It provides storage space for your files—you can even install applications, or save files to a PGP Virtual Disk — but it can also be locked at any time without affecting other parts of your computer. When you need to use the applications or files that are stored on a PGP Virtual Disk, you can unlock the disk and make the files accessible again.

PGP Virtual Disks are unlocked and locked by mounting and unmounting them from your computer. PGP Desktop helps manage this operation for you.

Although you specify a size for your PGP Virtual Disk, you can also create a dynamically-sizing disk, one that grows larger as needs require it. The size you specify when you are creating the disk is the maximum size the disk can become.

When a PGP Virtual Disk is mounted, you can:

- Move/copy files into or out of the mounted PGP Virtual Disk.
- Save files to the mounted PGP Virtual Disk.
- Install applications within the mounted PGP Virtual Disk.

Files and applications on a PGP Virtual Disk are stored encrypted. If your computer crashes while a PGP Virtual Disk is unmounted, the contents remain safely encrypted.

When a PGP Virtual Disk is unmounted, it does not appear within Windows Explorer or the Mac OS X Finder, and it is inaccessible to anyone without proper authentication.

It is important to remember that all your data remains secure in the encrypted file and is only deciphered when you access one of the files. Having the data for a volume stored in this manner makes it easy to manipulate and exchange PGP Virtual Disks with others but it also makes it easier to lose data if the file is somehow deleted. It is wise to keep a back up copy of these encrypted files so that the data can be recovered if something happens to the original.

For information about the PGP options that affect PGP Virtual Disk volumes, see *Disk Options* (on page 294).

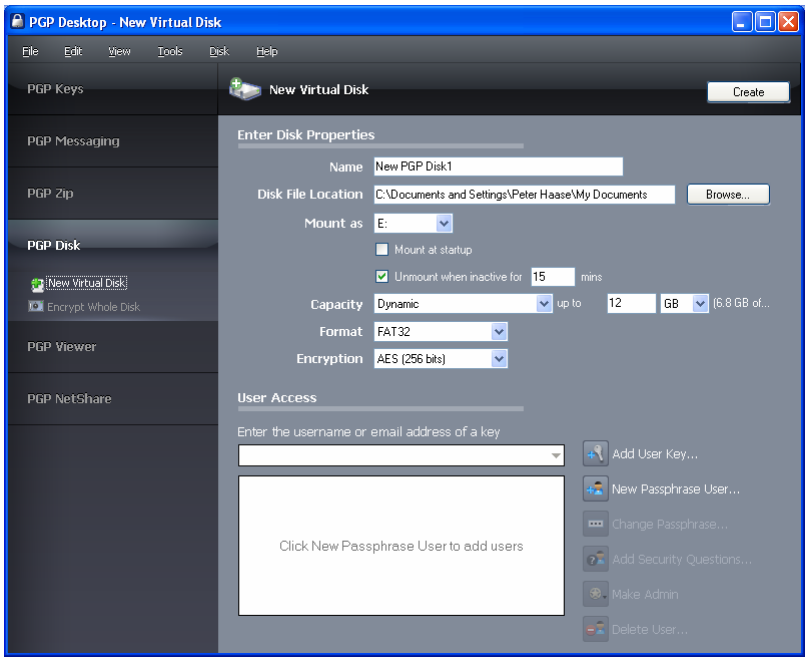
Caution: If you are using PGP Desktop in a PGP Universal Server-managed environment, you may be required to create a PGP Virtual Disk after installing PGP Desktop. If so, the size, file system, and algorithm may have been specified. For more information, see *Using PGP Desktop with PGP Universal Server* (on page 309).

Creating a New PGP Virtual Disk

To create a new PGP Virtual Disk

1 Open PGP Desktop.

2 Click the PGP Disk control box on the left pane of the PGP Desktop main screen, then click **New Virtual Disk**. Alternatively, select **File > New > PGP Virtual Disk**. The New Virtual Disk screen is displayed in the right pane of the screen.



3 In the **Name** field, type the name that you would like for the new PGP Virtual Disk.

4 In the **Disk File Location** field, accept the default location for the PGP Virtual Disk volume you are creating, or click **Browse** to specify another location.

5 From the **Mount as** menu, select the drive letter that you would like for the new PGP Virtual Disk.

You can:

- Accept the drive letter that PGP Desktop suggests for you.
- From the **Mount as** menu, select an available drive from the list.
- From the **Mount as** menu, select **Folder**, if you would like to mount the new PGP Virtual Disk to a folder instead of a drive letter. If you do this, a field is displayed next to the **Mount as** menu, so you can specify a location for the folder.

6 Select **Mount at Startup** to have your new PGP Virtual Disk volume mount at startup automatically. When selected, you are prompted for your PGP Virtual Disk passphrase when you start your computer.

7 Select **Unmount when inactive for n mins** [where *n* is a number of minutes] to have the PGP Virtual Disk unmount if you have not used your computer for a specific time interval that you specify (in minutes). This is helpful if you often leave your computer unattended—it is an additional safeguard that locks your PGP Virtual Disk if you forget to.

8 From the **Capacity** menu, select the desired type of PGP Virtual Disk. Your choices are:

- **Dynamic (resizable)**. This type of disk grows in capacity as files are added to it, yet it stays small until the additional space is needed. PGP Desktop manages this process, you only need to set the maximum size that you would like the disk to be. You can also compress this disk later, if you choose. This type of PGP Virtual Disk is available for FAT- or FAT32-formatted disks only.
- **Expandable**. This type of disk grows in capacity as files are added to it, yet it stays small until the additional space is needed. PGP Desktop manages this process, you only need to set the maximum size that you would like the disk to be. You can also compress this disk later, if you choose. This type of PGP Virtual Disk is available for NTFS-formatted disks only.
- **Fixed size**. This type of disk remains the same size, regardless of how many files are added to it. This type of PGP Virtual Disk is available for any type of formatted disk.

9 From the **Capacity** menu, set the size (in the case of Dynamic disks, the maximum size) for your new PGP Virtual Disk. Use whole numbers; no decimal places. Choose **KB** (kilobytes), **MB** (megabytes), or **GB** (gigabytes) from the menu.

The maximum allowable size for a PGP Virtual Disk depends on the size and format of your hard disk.

10 Specify a file system format for the volume:

- **FAT**. Volume must be 100 KB or larger.
- **FAT32**. Volume must be 260 MB or larger.
- **NTFS**. Volume must be 5 MB or larger (12 MB for Windows Vista).

11 Specify the encryption algorithm you want to use to protect your data:

- **AES (256 bits)**. AES (Advanced Encryption Standard) is a block cipher that can be used at 128, 192, or 256 bits. The more secure 256-bit version is used for creating PGP Virtual Disk volumes by default.
- **EME2-AES (256 bits)**. EME2 (Encrypt-Mix-Encrypt v2) is a stronger algorithm that encrypts twice for each operation. EME2 is a wide block mode algorithm that is currently under review by the IEEE Standards Working Group.
- **CAST5 (128 bits)**. CAST is a 128-bit block cipher. CAST is a strong, military-grade encryption algorithm that has a solid reputation for its ability to withstand unauthorized access.
- **Twofish (256 bits)**. Twofish is a 256-bit block cipher, symmetric algorithm. It was one of five algorithms that the U.S. National Institute of Standards and Technology (NIST) considered for the AES (Rijndael was selected).

12 You must have at least one user who can access your new PGP Virtual Disk. In the **User Access** section, specify who you want to give access to, and what method they use for access:

- **User Key**. To add users who authenticate with public-key cryptography:
  - Click **Add User Key**. The Add Key Users box is displayed, displaying the keypairs currently on your keyring.
  - From the **Add Key Users** box, select the key users you want by double-clicking the listing. Alternatively, you can drag the listing from the left side to the right, or select a listing and click **Add**. Click **OK** when you are finished.
- **Passphrase**. Click **New Passphrase User**. The Create New User dialog box is displayed.
  - For each new passphrase user, type a name for that user, type a passphrase for them, then type the passphrase again to confirm. Click **OK** to create the passphrase user. If you want to authorize more passphrase users, repeat the process.
  - To modify the passphrase for a passphrase user, select that user, then click **Change Passphrase**.

For information on creating effective, high-quality passphrases, refer to *Creating Strong Passphrases* (on page 305).

13 Click **Create** to start creating the new PGP Virtual Disk. A progress bar indicates how much of the PGP Virtual Disk has been initialized and formatted. When complete, your new PGP Virtual Disk is displayed in the PGP Disk control area.

14 The first user you create is granted administrator status, and there can only be one administrator at a time. However, you can grant administrator status to any of your other users, regardless of whether they are public key or passphrase users. Click their name in the User Access list, then click **Make Admin**.

15 Delete any user, other than the Administrator, by selecting their name and clicking **Delete User**. To delete the Administrator, first grant administrator status to another user, then delete the former administrator.

Viewing the Properties of a PGP Virtual Disk

Once a PGP Virtual Disk has been created, information about the disk and settings you can change are accessible from the Disk Properties screen.

To view the properties of a PGP Disk volume

- In the PGP Disk control box on the left pane of the PGP Desktop main screen, click the name of the disk. The Disk Properties is displayed in the right side of the main screen. Information displayed includes the PGP Virtual Disk file location, disk capacity, mounted drive letter, disk format, encryption type, and status of the disk (mounted or unmounted).

Finding PGP Virtual Disks

If you created PGP Virtual Disks using previous installations of PGP Desktop, you can easily find these volumes using the PGP Disk Search Assistant.

To find PGP Virtual Disks on your system

1. In PGP Desktop, click the **PGP Disk** control box. The PGP Disk main screen is displayed.
2. Select **File > Scan for PGP Disks**. The PGP Disk Search Assistant dialog box is displayed.
3. Follow the instructions displayed in the assistant.

Tip: To find the mounted volume of a specific PGP Virtual Disk, in PGP Desktop, right-click the name of the volume and select **Show disk location in Explorer**. Windows Explorer opens a new window displaying the contents of that volume.

Using a Mounted PGP Virtual Disk

Create, copy, move, and delete files and folders on a PGP Virtual Disk just as you normally do with any other disk on your system.

Anyone else who has access to the volume (either on the same computer or over the network) can also access the data stored there. It is not until you unmount the volume that the data is protected.

Caution: Although each PGP Virtual Disk file is encrypted and cannot be accessed by anyone without proper authorization, it can still be deleted from your system. Anyone with access to your system could delete the encrypted file containing the PGP Virtual Disk. For this reason, keeping a backup copy of the encrypted file is an excellent safety measure, as is keeping your computer locked when you are not nearby.

Mounting a PGP Virtual Disk

When you create a new PGP Virtual Disk, it is automatically mounted so you can begin using it to store your files.

To secure the contents of a volume, you must unmount it. Once a volume is unmounted, its contents remain secured in an encrypted file where they are inaccessible until the volume is mounted once again.

There are several ways to mount a PGP Virtual Disk:

- In PGP Desktop, select the PGP Virtual Disk you want to mount and select **Disk > Mount**.
- In PGP Desktop, select the PGP Virtual Disk you want to mount and then click **Mount** in the upper-right corner on Windows systems, or the **Mount** icon on the toolbar on Mac OS X systems.
- Change the properties of the PGP Virtual Disk so that it mounts when your computer starts.

On Windows systems only:

- During creation of the PGP Virtual Disk, select the **Mount at Startup** checkbox. The volume mounts automatically when you start Windows. If you do not select this during creation of the PGP Virtual Disk, you can set it as an option later.
- In Windows Explorer, right-click the PGP Virtual Disk file, and select **PGP > Mount PGP Virtual Disk** from the shortcut menu.

Mounted PGP Virtual Disk volumes appear as empty drives in Windows Explorer and Mac OS X Finder.

Unmounting a PGP Virtual Disk

You lock a PGP Virtual Disk by unmounting it. Once a PGP Virtual Disk is unmounted, its contents are locked in the encrypted file associated with the volume. Its contents are inaccessible until the volume is mounted once again.

Caution: You may lose data if you unmount a PGP Virtual Disk when some files that it contains are open. Specify options for unmounting disks by selecting **Tools > PGP** and clicking the **Disk** tab. One option is **Allow PGP Virtual Disks to unmount even while files are still open**. If that option is selected, the option for **Don't ask before unmounting** also becomes available. **Do not use these options unless you are familiar with them.** While these options can be useful for advanced users who protect their data with regular data backups, they are not recommended for most users.

There are several ways to unmount a PGP Virtual Disk volume:

- Click the PGP Disk control box on the left pane of the PGP Desktop main screen, then select the volume you want to unmount. Click **Unmount** in the upper-right corner, or select **Disk > Unmount**.
- In Windows Explorer, right-click on the PGP Virtual Disk file, then select **PGP > Unmount PGP Virtual Disk** from the shortcut menu.
- Use the hot key to unmount all PGP Virtual Disks. The default hot key is **Ctrl+Shift+U**. The hot key must be enabled first.

Once a PGP Virtual Disk is unmounted, its contents remain locked and inaccessible until the volume is mounted once again.

Compacting a PGP Virtual Disk

To free up additional space on your PGP Virtual Disk, compact the disk. If the PGP Virtual Disk is mounted, you must unmount the disk first, before you can compact it.

Note: Only FAT- or FAT32 formatted PGP Virtual Disks that are dynamic (not fixed in size) can be compacted. NTFS-formatted disks or fixed size disks cannot be compacted.

To compact a PGP Virtual Disk

- Do one of the following:
  - In Windows Explorer navigate to the location of the .pgd file. Right-click the file and select **PGP Desktop > Compact unused space**.
  - In PGP Desktop, click the PGP Disk control box on the left pane of the PGP Desktop main screen, select the PGP Virtual Disk you want to compact, and then select **Disk > Compact**. You can also right-click the PGP Virtual Disk in the PGP Disk control box and select **Compact** from the shortcut menu.

Re-Encrypting PGP Virtual Disks

You can re-encrypt all data stored on a PGP Virtual Disk. You might do this for either (or both) of two reasons:

- You want to change the encryption algorithm currently being used to protect the volume.
- You suspect there has been a security breach.

With re-encryption, you encrypt your PGP Virtual Disk again, but use a different underlying encryption key.

Caution: Adept users may be able to search the memory of a computer for the underlying encryption key of a PGP Virtual Disk. These users could use the key to access the volume even after being removed from the user list. Re-encrypting the disk changes this underlying key and prevents this kind of intrusion.

To re-encrypt a PGP Virtual Disk

1. Click the PGP Disk control box on the left pane of the PGP Desktop main screen, then select the PGP Virtual Disk you want to re-encrypt.
2. If the PGP Virtual Disk that you want to re-encrypt is mounted, unmount it.
3. Select the PGP Virtual Disk you want to re-encrypt.
4. Select **Disk > Re-Encrypt**.
5. Type your passphrase for the volume. The PGP Re-Encryption Assistant is displayed.
6. Read the introductory information, and then click **Next**. A dialog box is displayed displaying:
   - The current encryption algorithm protecting your PGP Virtual Disk.
   - The available encryption algorithms other than the one you originally chose.

   For example, if your PGP Virtual Disk is currently encrypted with AES, then the **CAST5** and **Twofish** options appear in the **New Algorithm** list.
7. Do one of the following:
   - To re-encrypt the volume using the current algorithm, select the **Re-encrypt to the same algorithm** checkbox, then click **Next**. The PGP Virtual Disk volume is re-encrypted using the same encryption algorithm as before.
   - To re-encrypt the volume using a different algorithm, select the algorithm from the **New Algorithm** menu, then click **Next**. The PGP Virtual Disk volume is re-encrypted using the new encryption algorithm you selected.

8 When the current status displays Done, click **Next**.

9 Click **Finish** to complete the re-encryption process.

Working with Alternate Users

This section describes how to add, delete, and disable alternate user accounts for your PGP Virtual Disks. Also included is information on how to change the rights for users, including granting administrator rights to a user.

Adding Alternate User Accounts to a PGP Virtual Disk

The administrator of a PGP Virtual Disk can make it available to other users. Those users can access the volume using their passphrases or private keys.

Make sure the PGP Virtual Disk is *not* currently mounted, otherwise, you cannot add alternate user accounts.

To add alternate user accounts to a PGP Virtual Disk

1 Click the PGP Disk Control box on the left pane of the PGP Desktop main screen, then select the PGP Virtual Disk to which you want to add an alternate user account.

2 Do one of the following:

- To add a new public key user, click **Add User Key**. The Add Key Users dialog box is displayed.
- To add a new passphrase user, click **New Passphrase User**. The PGP Disk New User dialog box is displayed.

3 Do one of the following:

- If you selected **Add User Key**, in the Add Key Users dialog box, select a public key from the list and click **OK**.
- If you selected **New Passphrase User**, in the PGP Disk New User dialog box, type the user name, the passphrase for the PGP Virtual Disk you are adding the user to, then type the passphrase again in the PGP Disk New User box and click **OK**.

The alternate user account is added.

Deleting Alternate User Accounts from a PGP Virtual Disk

At some point you may want to remove the ability of an alternate user to access a PGP Virtual Disk.

Make sure that the PGP Virtual Disk is *not* mounted. You cannot remove an alternate user account if the volume is mounted.

To remove an alternate user account from a PGP Virtual Disk

1. Click the PGP Disk control box on the left pane of the PGP Desktop main screen, then select the PGP Virtual Disk for the user account you want to delete.
2. In the User Access list, select the name of the alternate user whose account you want to remove. You cannot remove the Administrator.
3. Click **Delete User**. The Passphrase dialog box is displayed, prompting you for either the administrator passphrase or the passphrase for the user account being removed.
4. Type the passphrase, then click **OK**. The alternate user account is removed.

Disabling and Enabling Alternate User Accounts

To prevent access to a PGP Virtual Disk for an alternate user without deleting their account entirely, you can instead temporarily disable their access.

Make sure that the PGP Virtual Disk is *not* mounted. You cannot disable or enable an alternate user account if the volume is mounted.

To disable or enable an alternate user account from a PGP Virtual Disk

1. Click the PGP Disk control box on the left pane of the PGP Desktop main screen, then select the PGP Virtual Disk for the user account you want to change.
2. In the User Access list, do one of the following:
   - To disable a user, right-click the name of the alternate user account you want to disable and select **Disable**. The Passphrase dialog box is displayed, prompting you for either the administrator passphrase or the passphrase for the user account being disabled. Type the passphrase, then click **OK**. The alternate user account is disabled.
   - To enable a user that you previously disabled, right-click the name of the alternate user account you want to enable and select **Enable**. The Passphrase dialog box is displayed, prompting you for either the administrator passphrase or the passphrase for the user account being disabled. Type the passphrase, then click **OK**. The alternate user account is enabled.

Changing Read/Write and Read-Only Status

Users of a PGP Virtual Disk can have either full read/write privileges, or read privileges only. You can change these privileges for a user at any time.

Make sure the selected PGP Virtual Disk is not mounted. You cannot change rights if the volume is mounted.

To change the rights for a user on a PGP Virtual Disk

1. Click the PGP Disk control box on the left pane of the PGP Desktop main screen, then select the PGP Virtual Disk for the user account you want to change.
2. In the User Access list, select the name of the user whose status you want to change.
3. Do one of the following:
   - To change the user to read-only access, right-click the user's name and select **Read-Only**.
   - To change the user to read/write access, right-click the user's name and select **Read/Write**.

   The Enter Passphrase dialog box is displayed.
4. Type the administrator passphrase for the PGP Virtual Disk, then click **OK**. The rights of the selected user are changed.

Granting Administrator Status to an Alternate User

You can change the status of a user account from alternate to administrator.

Make sure the selected PGP Virtual Disk is *not* mounted. You cannot make a user into an administrator if the volume is mounted.

To grant administrator status

1. Click the PGP Disk control box on the left pane of the PGP Desktop main screen, then select the PGP Virtual Disk for the user account you want to change.
2. In the User Access list, select the user you want to make administrator of the PGP Virtual Disk. Select either a passphrase user or yourself (if you are not the current administrator). Note that you cannot make a public key user an administrator of the PGP Virtual Disk.
3. In the option bar on the left, click **Make Admin**. The selected user account is changed to administrator.

Note: You can grant Administrator status to only one user account at a time. By granting Administrator status to one account, you also remove it from another.

Changing User Passphrases

Make sure the selected PGP Virtual Disk is *not* mounted. You cannot change the passphrase if the volume is mounted.

To change a user's passphrase for a PGP Virtual Disk

1. Click the PGP Disk control box on the left pane of the PGP Desktop main screen, then select the PGP Virtual Disk on which you are a user.
2. Select the name of a passphrase user from the User Access list, and click **Change Passphrase**. The Enter Passphrase dialog box is displayed

   Tip: You can also right-click the user's name and select **Change User Passphrase** from the shortcut menu.
3. Type the current passphrase for the user and click **OK**. The PGP Enter Confirmed Passphrase dialog box is displayed
4. Type a new passphrase, type the passphrase again to confirm it, and click **OK**. The passphrase is changed.

Deleting PGP Virtual Disks

At some point you may decide you no longer need a particular PGP Virtual Disk and may choose to delete the disk entirely.

Caution: When you delete a PGP Virtual Disk, all data on it is also deleted. *There is no way to retrieve the data once you delete a PGP Virtual Disk*. Make sure that you have copied any data that you want to save to another location *before deleting a PGP Virtual Disk*.

Make sure the selected PGP Virtual Disk is *not* mounted. You cannot delete the PGP Virtual Disk if the volume is mounted.

To delete a PGP Virtual Disk

1. Click the PGP Disk control box on the left pane of the PGP Desktop main screen, then select the PGP Virtual Disk you want to delete.
2. Select **Disk > Delete**. A confirmation dialog box is displayed.
3. Do one of the following:

- Click **OK** to delete the PGP Virtual Disk from the PGP Desktop listing. The PGP Virtual Disk remains on your system.
- Click **Delete PGP Disk** to remove the PGP Virtual Disk from the PGP Desktop listing, as well as deleting it from your hard drive.

Maintaining PGP Virtual Disks

This section describes how to take proper care of the PGP Virtual Disk that you use with your computer.

Mounting PGP Virtual Disk Volumes on a Remote Server

You can place PGP Virtual Disk volumes on any kind of server (Windows or UNIX). The volumes can then be mounted by anyone with a Windows computer and PGP Desktop.

Note: The first person to mount the PGP Virtual Disk volume locally has read-write access to the volume. No one else is then able to access the volume. If you want others to be able to access files within the volume, you must mount the volume in read-only mode (applies to FAT and FAT32 file system formats only). All users of the volume then have read-only access.

If the PGP Virtual Disk volume is stored on a Windows server, you can also mount the volume remotely on the server and allow people to share the mounted volume. However, this action provides no security for the files within the volume.

Backing up PGP Virtual Disk Volumes

Backing up the contents of your PGP Virtual Disk is the best way to safeguard your information from hardware failure or other loss.

It is not advisable to back up the contents of a mounted (and therefore, decrypted) PGP Virtual Disk just as you would any other volume. The contents are not encrypted, and are accessible to anyone who can restore the backup. Instead, instead make a backup copy of the encrypted volume.

To back up PGP Virtual Disks

1. Unmount the PGP Virtual Disk.
2. Copy the unmounted encrypted file to a diskette, tape, or removable cartridge just as you would any other file. Even if some unauthorized person has access to the backup, he or she will not be able to decipher its contents.

When making backups of the encrypted files, keep these issues in mind:

- Backing up encrypted files to a network drive gives others plenty of opportunity to guess at a weak passphrase. It is much safer to back up only to devices over which you have physical control.
- A lengthy, complicated passphrase helps further improve the security of your data.
- If you are on a network, make sure that any network back up system does not back up the files in your *mounted* PGP Virtual Disk. (You may need to discuss this with your System Administrator.) Once a PGP Virtual Disk is mounted, its files are decrypted and can be copied to a network backup system that way.

Exchanging PGP Virtual Disks

You can exchange PGP Virtual Disk with other users who have PGP Desktop installed on their computers. You do that by sending them a copy of the PGP Virtual Disk data file, which contains the volume data. Here are some of the ways you might exchange PGP Virtual Disk:

- As mail attachments
- On a removable disk or CD
- Over a network

Once the other user has the PGP Virtual Disk file, they can mount it on a system running PGP Desktop and use the correct passphrase to access it. If the volume was encrypted to their public key, they would use their private key for access.

Note: Public key is the most secure protection method when adding alternate users to a PGP Virtual Disk because: (1) You do not need to exchange a passphrase with the alternate user which, depending on your method, could be intercepted or overheard. (2) The alternate user does not need to memorize another passphrase which could be forgotten. (3) It is easier to manage a list of alternate users if each uses their own private key to unlock the volume.

The PGP Virtual Disk Encryption Algorithms

Encryption employs a mathematical formula to scramble your data so that no one else can use it. When you apply the correct mathematical key, you unscramble the data. The PGP Virtual Disk volume encryption formula uses random data for part of the encryption process.

The PGP Desktop application offers strong algorithm options for protecting your PGP Virtual Disk volumes: AES-256, CAST, and Twofish.

- The Advanced Encryption Standard (AES) is the NIST-approved encryption standard. The underlying cipher is Rijndael, a block cipher designed by Joan Daemen and Vincent Rijmen. The AES replaces the previous standard, the Data Encryption Standard (DES). PGP Virtual Disk volumes can be protected with the strongest variation of AES, AES-256 (that is, AES with a key size of 256 bits).
- CAST is considered an excellent block cipher because it is fast and very difficult to break. Its name is derived from the initials of its designers, Carlisle Adams and Stafford Tavares of Northern Telecom (Nortel). Nortel has applied for a patent for CAST, but they have made a commitment to make CAST available to anyone on a royalty-free basis. CAST appears to be exceptionally well-designed by people with good reputations in the field.

  The design is based on a very formal approach, with a number of formally provable assertions that give good reasons to believe that it probably requires key exhaustion to break its 128-bit key. CAST has no weak keys. There are strong arguments that CAST is immune to both linear and differential cryptanalysis, the two most powerful forms of cryptanalysis in the published literature, both of which have been effective in cracking the Data Encryption Standard (DES).
- Twofish is a relatively new, but well regarded 256-bit block cipher, symmetric algorithm. Twofish was one of five algorithms that the U.S. National Institute of Standards and Technology (NIST) considered for the new Advanced Encryption Standard (AES).

Special Security Precautions Taken by PGP Virtual Disk

PGP Desktop takes special care to avoid security problems with PGP Virtual Disk volumes that other programs may not.

These precautions also apply to whole disk encrypted drives.

Passphrase Erasure

When you enter a passphrase, PGP Desktop uses it only for a brief time, then erases it from memory. PGP Desktop also avoids making copies of the passphrase. The result is that your passphrase typically remains in memory for only a fraction of a second. Without this critically important feature, someone could search for your passphrase in your computer memory while you were away from the system. You would not know it, but they would then have full access to data protected by this passphrase.

Virtual Memory Protection

Your passphrase or other keys could be written to disk as part of the virtual memory system swapping memory to disk. PGP Desktop takes care that the passphrases and keys are never written to disk. This feature prevents a potential intruder from scanning the virtual memory file looking for passphrases.

Hibernation

In Windows, Hibernate mode writes an image of your computer's entire main memory storage, including PGP Virtual Disk information, to a file on your hard drive. If your PGP Virtual Disk is open when you invoke hibernation, sensitive data will be written to your hard drive, including the session key, but *not* your passphrase.

Because hibernation is inherently insecure, PGP Corporation recommends using the PGP Whole Disk Encryption feature if you use hibernation or make sure to enable the PGP Virtual Disk options **Unmount when computer goes to sleep** and **Prevent sleep if disk(s) cannot be unmounted**, located on the Disk tab of the PGP Options.

Memory Static Ion Migration Protection

When you mount a PGP Virtual Disk volume, your passphrase is turned into a key. This key is used to encrypt and decrypt the data on your PGP Virtual Disk volume. While the passphrase is erased from memory immediately, the key (from which your passphrase cannot be derived) remains in memory while the disk is mounted.

This key is protected from virtual memory; however, if a certain section of memory stores the exact same data for extremely long periods of time without being turned off or reset, that memory tends to retain a static charge, which could be read by attackers. If your PGP Virtual Disk volume is mounted for long periods, over time, detectable traces of your key could be retained in memory. Devices exist that could recover the key. You won't find such devices at your neighborhood electronics shop, but major governments are likely to have a few.

PGP Desktop protects against this by keeping two copies of the key in RAM, one normal copy and one bit-inverted copy, and inverting both copies every few seconds.

Other Security Considerations

In general, the ability to protect your data depends on the precautions you take, and no encryption program can protect you from sloppy security practices. For instance, if you leave your computer running with sensitive files open when you leave your desk, anyone can access that information or even obtain the key used to access the data.

Here are some tips for maintaining optimal security:

- Unmount PGP Virtual Disk volumes when you leave your computer. This way, the contents will be safely stored in the encrypted file associated with the volume until you are ready to access it again.
- Use a screen saver with a password so that it is more difficult for someone to access your computer or view your screen when you are away from your desk.
- Make sure that your PGP Virtual Disk volumes cannot be seen by other computers on the network. You may need to talk to your network management people to guarantee this. The files in a mounted PGP Virtual Disk volume can be accessed by anyone who can see them on the network.
- Never write down your passphrases. Pick something you can remember. If you have trouble remembering your passphrase, use something to jog your memory, such as a poster, a song, a poem, a joke, but *do not write down your passphrases*.
- If you use PGP Desktop at home and share your computer with other people, they will probably be able to see your PGP Virtual Disk volume files. As long as you unmount the PGP Virtual Disk volumes when you finish using them, no one else will be able to read their contents.
- If another user has physical access to your computer, that person can delete your PGP Virtual Disk files as well as any other files or volumes. If physical access is an issue, try either backing up your PGP Virtual Disk files or keeping them on an external device over which only you have physical control.
- Be aware that copies of your PGP Virtual Disk volume use the same underlying encryption key as the original. If you exchange a copy of your volume with another and both change your master passwords, both of you are still using the same key to encrypt the data. While it is not a trivial operation to recover the key, it is not impossible.

  You can change the underlying key by re-encrypting the volume.

12 Creating and Accessing Mobile Data with PGP Portable

Use PGP Portable to distribute encrypted files to users who do not have PGP Desktop software. Use PGP Portable to transport files securely to other systems that do not or cannot have PGP software installed.

PGP Portable provides:

- Portability of secured documents
- Ease of distribution of secured documents

There are two types of users of PGP Portable: the user who creates the PGP Portable Disk containing secured data, and the user who does not have PGP software but needs to access that secured data. You might also be both types of users: creating a PGP Portable Disk that you can take and use on a computer at a customer's site, for example.

On Windows systems, you can create PGP Portable Disks as well as access the encrypted data.

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Creating PGP Portable Disks

PGP Portable Disks can be created in one of two ways: using a Windows Explorer shortcut menu, or using a command line tool. This section describes normal use of the shortcut menu. For information on the command line, see Using the PGP Portable Command Line Tool.

To create a PGP Portable Disk, be sure that you have:

- Installed PGP Portable on a Windows system that is already running PGP Desktop.
- Properly licensed the PGP Desktop installation that is bound to a PGP Universal Server.

A PGP Portable Disk can be created on one of two targets:

- A folder on a local drive, remote file share, or CD/DVD.
- A locally mounted removable device, such as a USB flash drive, that is no larger than 128 GB.

When you create a PGP Portable Disk, PGP Universal Server policy also enforces passphrase strength. If you use a passphrase that does not meet PGP Universal Server policy, an error message is displayed.

Creating a PGP Portable Disk from a Folder

When you want to eventually burn a CD or DVD containing the PGP Portable Disk, use this option.

Note: Be sure that you have copied the data you want to protect and share into the folder.

To create a PGP Portable Disk from a folder

1. Locate and right-click the source folder, and then select **Create PGP Portable Disk Folder** from the shortcut menu.
2. In the Create PGP Portable Disk dialog box, enter and confirm the passphrase. This passphrase will be required to access the data in the PGP Portable Disk.
3. Click **Create**.
   - If the folder you are using to create the PGP Portable Disk is on a read-only device (such as CD or DVD), a Save As dialog box is displayed. Browse for the location on your local drive where you want the PGP Portable Disk destination folder to be created and click **Save**.

   When completed, the destination folder is created. The folder name is the source folder name with "-PGP Portable" appended to the name.
4. Burn the entire contents of the destination folder to the CD/DVD. The PGP Portable Disk destination folder contains:
   - The PGP Portable Windows executable (`pgpportable.exe`)
   - The PGP Portable Mac OS X executables (`PGP Portable App`)
   - A Windows autorun file (`autorun.inf`)
   - A PGP Portable Disk File (`pgpportable.pgd`)

   The PGP Portable Disk File (`pgpportable.pgd`) contains within it all files found in the original target folder. The PGP Portable Disk File is encrypted to the passphrase specified.

   Be sure that you do not delete any of these files from the PGP Portable Disk.

Tip: Be sure that you burn only the contents of the folder to disc, and not the folder itself. If you burn the folder to a disc, PGP Portable will not automatically launch on systems where autorun is enabled.

Creating a PGP Portable Disk from a Removable USB Device

When you want to create the PGP Portable Disk directly onto a removable USB device, such as a flash drive, use this option.

Note: The removable USB device must be smaller than 128 GB (137438953472 bytes). If you attempt to create a PGP Portable Disk on a removable USB device that is larger than 128 GB, you will receive an error message.

To create a PGP Portable Disk from a removable USB device

1. Locate and right-click the mounted removable USB device, and then select **Create PGP Portable Disk** from the shortcut menu.
2. The PGP Portable Disk creation application is displayed with a warning that the contents of the drive will be erased.
3. In the Create PGP Portable Disk dialog box, enter and confirm the passphrase. This passphrase will be required to access the data in the PGP Portable Disk.
4. Click **Format**. When completed, the PGP Portable Disk is created. The PGP Portable Disk File is encrypted to the passphrase specified.
5. You are prompted to enter the passphrase and then the PGP Portable Disk is mounted. A notification message is displayed from the system tray informing you of the drive number for the mounted PGP Portable Disk.
6. If desired, copy the data that you want to protect to the mounted PGP Portable Disk. The PGP Portable Disk contains no files when it is first created.
7. Unmount the PGP Portable Disk (in the system tray, click the PGP Portable icon and select **Unmount and Exit**). The drive that was mounted for the PGP Portable Disk is unmounted.
8. Properly eject the USB device and remove the device from your computer. You can now access the contents of the PGP Portable Disk on another system that supports PGP Portable.

Warning: Be sure that you properly unmount a removable USB device before physically removing it from the system. Failure to do so may result in corrupted file contents.

The removable device contains the following files:

- The PGP Portable Windows executable (`pgpportable.exe`)

- The PGP Portable Mac OS X executables (`PGP Portable.app`)
- A Windows autorun file (`autorun.inf`)
- The PGP Portable Disk File (`pgpportable.pgd`)

Be sure that you do not delete any of these files from the PGP Portable Disk.

Creating Read/Write or Read-Only PGP Portable Disks

To have read/write access to a PGP Portable Disk, the PGP Portable Disk must be located on read/write media (such as a flash drive or other removable disk). Read/write access is enabled for a PGP Portable Disk only while it resides on the removable device on which it was created.

- PGP Portable Disks created on read-only media are themselves read-only (for example, CD-ROMs).
- PGP Portable Disks accessed on the removable device on which they were created are read/write (for example, a USB drive that is mounted as read-write).

Accessing Data on a PGP Portable Disk

The contents of a PGP Portable Disk can be accessed in three ways:

- By mounting the CD, DVD, or removable uSB drive on a Windows system, and running the PGP Portable Disk application (which launches automatically if autorun is enabled).
- By mounting the CD, DVD, or removable USB drive on a Mac OS X system, and running the PGP Portable Disk application.

When you access data on a PGP Portable Disk, remember that you are actually mounting two items: the removable device on which the PGP Portable Disk resides, and the PGP Portable Disk itself (which is mounted as a separate item). When you are finished, be sure to unmount thePGP Portable Disk before safely ejecting the removable device.

The steps to access data on a PGP Portable Disk are similar for Windows and Mac OS X systems.

Warning: Be sure that you properly unmount a removable device before physically removing it from the system. Failure to do so may result in corrupted file contents.

To access data on a PGP Portable Disk using a Windows system

1. Insert the removable device on which the PGP Portable Disk is located. This can be a CD/DVD or a flash or removable drive.
2. Do one of the following:
   - On Windows systems where autorun is enabled, select **Mount PGP Portable Disk**.
   - On Windows systems where autorun is disabled, open the mounted removable device and browse for the PGP Portable application (`pgpportable.exe`). Double-click the application.
   - On Windows 7 systems, open the disk by double-clicking the USB disk icon in Windows Explorer.

   The PGP Portable dialog box is displayed.

3. Enter the passphrase for the PGP Portable Disk. The PGP Portable Disk is mounted.

   A notification message is displayed from the system tray informing you of the drive number for the mounted PGP Portable Disk. If the PGP Portable Disk is mounted as a read-write device, you can add data to it. If the PGP Portable Disk is mounted as a read-only device, you cannot add data.

   Note: The volume name for the PGP Portable Disk is unique to PGP Portable and may not match the name of the volume when created.

4. When you are finished using the PGP Portable Disk, unmount the PGP Portablee Disk (in the system tray, click the PGP Portable icon and select **Unmount and Exit**. The drive that was mounted for the PGP Portable Disk is unmounted.
5. Properly eject the USB device or disc from your computer

Changing the Passphrase for a PGP Portable Disk

There may be times when it is necessary to change the passphrase associated with a PGP Portable Disk. Note that you cannot change the passphrase on any PGP Portable Disk that is read-only (including PGP Portable Disks burned to CD/DVD media).

To change the passphrase on a PGP Portable Disk using a Windows system

1. Insert the removable device on which the PGP Portable Disk is located. This can be a CD/DVD or a flash or removable drive.
2. Do one of the following:
   - On Windows systems where autorun is enabled, select **Mount PGP Portable Disk**.
   - On Windows systems where autorun is disabled, open the mounted removable device and browse for the PGP Portable application (`pgpportable.exe`). Double-click the application.
   - On Windows 7 systems, open the disk by double-clicking the USB disk icon in Windows Explorer.
3. Enter the passphrase for the PGP Portable Disk when prompted. The PGP Portable Disk is mounted. A notification message is displayed from the system tray informing you of the drive number for the mounted PGP Portable Disk.
4. Open PGP Portable by right-clicking the system tray icon and choosing **Open PGP Portable**.
5. In the PGP Portable dialog box, click **Change Passphrase**.
6. Enter the current passphrase, enter and confirm the new passphrase, and click **Change**. The passphrase is changed.

   The Passphrase Quality bar provides a basic guideline for the strength of the passphrase you are creating. For more information, see *The Passphrase Quality Bar* (on page 304).

Unmounting a PGP Portable Disk

Be sure that you properly unmount a removable device before physically removing it from the system. Failure to do so may result in corrupted file contents.

To unmount a PGP Portable Disk

1. Open PGP Portable. To do this, do one of the following:
   - To open PGP Portable on a Windows system, right-click the system tray icon and choose **Unmount and Exit**.
   - To open PGP Portable on a Mac OS system, click the icon in the dock and choose **Unmount and Exit**.

   The PGP Portable Disk is unmounted.
2. Safely eject and remove the device from your system.

13 Using PGP NetShare

PGP NetShare provides transparent, end-to-end encryption for shared file storage.

Note: If you are using PGP Desktop in a PGP Universal Server-managed environment, your PGP Universal Server administrator may have disabled certain features. When a feature is disabled, the control item in the left side is not displayed and the menu and other options for that feature are not available. The graphics included in this guide depict the default installation with all features enabled. If your PGP Universal Server administrator has disabled this functionality, this section does not apply to you.

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About PGP NetShare

PGP NetShare enables specific users to share protected files in a shared space, such as on a corporate file server, in a shared folder, or on removable media such as a USB drive.

Note: In circumstances where you do not have an easily accessible shared space, using a USB removable drive is one way to share your PGP NetShare files.

The files are protected by encryption, but continue to appear as normal application files—Notepad, Microsoft Word, HTML, Microsoft Excel, and so on. Applications can directly read from and write to the files; the fact that the files are protected is transparent to the applications. Anyone else with access to the shared space can see the files, but they cannot read/use them.

PGP NetShare is client-only software—there is nothing to install on the file server and it works with your existing storage infrastructure. The encryption and decryption of protected files and folders is done only on the client. Server backups will archive encrypted files (ciphertext) which is unreadable to anyone who is not authorized to view the files.

Those who have access to the protected files are called *Users,* and folders containing the protected files are called *Protected Folders*.

Users are assigned roles that specify the type of actions that user can make. For more information on roles, see *PGP NetShare Roles* (on page 218).

The Protected Folder is any folder designated to hold protected files. Files that are in a folder converted to a Protected Folder are automatically encrypted; files moved into a Protected Folder after its creation are encrypted when they are added. You can also protect individual files by selecting **Protect Individual Files** in the NetShare tab of **Tools > PGP Options**.

Caution: PGP NetShare does *not* provide access control for the files in a Protected Folder. Because it is file-level access control, anyone with access to the files in a Protected Folder can add new, unencrypted files and/or remove existing encrypted files. This makes it important that you establish your Protected Folder in a secure shared space; but it also means that your network administrator can back up the files in the Protected Folder without being able to read them.

PGP NetShare can be used with both the PGP Virtual Disk and PGP Whole Disk Encryption features of PGP Desktop. This means that you can create a Protected Folder in a PGP Virtual Disk or if your drive is encrypted by PGP WDE. PGP NetShare protection is designed for files in a shared, collaborative environment, usually over a network. PGP Virtual Disk and PGP Whole Disk Encryption protect individual drives or portions of drives on a local system. All three are valuable security products that are designed for slightly different circumstances. In fact, you can use all three on the same system to provide strong security for your data.

Here is an example to help you understand how you might use PGP NetShare:

> Suppose you are the VP of Finance for a small company with two major product lines. The company president calls you into her office and asks you to spearhead an initiative to see if adding another major product line would be successful.
>
> She wants you and representatives from Marketing, Sales, Engineering, Manufacturing, and Support to examine the issue from all sides and make a recommendation. The whole project needs to be low profile.
>
> Fortunately, in your organization everyone uses PGP Desktop in a PGP Universal Server-managed environment, so the solution for creating, sharing, updating, and securely storing the files you need is already in place: PGP NetShare.
>
> Because members of your project are physically dispersed, you need to set up the Protected Folder for the project in a location accessible to everyone. For example, creating the Protected Folder on the corporate network would allow all project members to access it.
>
> Once the Protected Folder is established, the project members can add new files, open and work on existing files, or removes files without worrying about the fact that they are protected by encryption—the encryption and decryption are totally transparent.

Another advantage of PGP NetShare is that the files appear normally to anyone who is not an Authorized User, thus allowing your network administrator to back up the files in the Protected Folder the same way they back up all the other files on the corporate network. The backups are also protected by encryption.

Note: The PGP NetShare tracking engine ignores EFS-protected objects. This is by design and ensures any complications are avoided due to the fact EFS is tightly coupled with NTFS. Any files or folders that are EFS-encrypted and are moved or copied into a PGP NetShare-protected folder retain their EFS-encryption, but do not become PGP NetShare-protected. To PGP NetShare protect these objects, remove the EFS encryption before moving/copying into a folder.

PGP NetShare provides complete security for files in a Protected Folder. Data is always encrypted, even when a Protected Folder is being accessed or is in transit from or to project members.

Caution: If you choose **Save As** for a protected file, and save it *outside* the Protected Folder, the new version will *not* be protected.

PGP NetShare Roles

- **Admin**: This is the "owner" of the protected folder. The Admin can add users and remove users, and can change the roles of Users and Group Admins. The Admin has full rights to read and write to the protected folder. There can be only one Admin for each protected folder and it is created automatically by the creator — you do not need to specify an Admin manually for the protected folder. There is only one Admin per folder

  You become an Admin by creating a protected folder, adding yourself as a member, and applying the Admin role to yourself. You can be a member of multiple Admin sets at one time.

  The Admin role cannot be removed by a Group Admin, but an Admin can reassign his or her role to another member.

  Admins must have full write access to the protected folder.

- **Group Admin**: This is an "administrator" of the protected folder. The Group Admin can add and remove users, and can promote users to Group Admins or demote Group Admins to Users. There can be as many Group Admins as needed. The Group Admin has full rights to read and write to the protected folder. There can be multiple Group Admins for each PGP NetShare protected folder.

  Group Admins must have full write access to the protected folder.

- **Users**: This is the set of users who are allowed to access the protected files in the shared space. The files in the protected folder are encrypted to the keys of the Users. You become a User when a protected folder is created, you are added to the PGP NetShare, and the Admin or Group Admin assigns the User role to you. All Users have equal privileges to read and write to the protected folder. Users do not have the ability to change the roles of other Users. You can be a member of multiple User sets at one time. Users do not have the right to decrypt files or folders. This is limited, so Users cannot decrypt files and re-encrypt the files with new role assignments.

Note: If you have a folder that is protected with a previous version of PGP Desktop, you must select new roles for existing users manually. For more information, see *Changing a User's Role* (on page 232).

Licensing PGP NetShare

In order to use PGP NetShare, you must be running PGP Desktop 9.5 or later and have a license that supports PGP NetShare.

To see if your copy of PGP Desktop supports PGP NetShare

1. Open PGP Desktop.
2. Select **Help > License**. The PGP Desktop License dialog box is displayed.
3. In the **Product Information** section, find the **PGP NetShare** icon. Move your cursor over the product name to see information about the product and to find out if you are currently licensed to use it. If PGP NetShare is not supported, contact your PGP administrator about getting a license that supports PGP NetShare.

If you created one or more Protected Folders with a PGP NetShare license that has now expired, you will not be able to create any new Protected Folders, use the files currently in any Protected Folders, add files to existing Protected Folders, or be added as an Authorized User for a new Protected Folder.

In order to regain access to the decrypted versions of any files in an existing Protected Folder, you must either obtain a new PGP NetShare license or decrypt the files/folders in your Protected Folders using the **Remove <file name> from PGP NetShare** command (for more information, see *Accessing PGP NetShare Features using the Shortcut Menu* (on page 241)).

Authorized User Keys

PGP NetShare uses the PGP keys of the Users you designate to control access to the decrypted files in the Protected Folder, and it uses the private keys of Authorized Users to sign new files that are added to the Protected Folder.

Note: PGP NetShare does not support the use of passphrases to protect files. PGP keys must be used to protect files.

When a set of Users is created, the creator specifies the public keys of the users who will be able to use the files in the Protected Folder. To use those files, Users must have the corresponding private key on their system in order to gain decrypted access to the files.

Establishing a PGP NetShare Admin (Owner)

While a PGP NetShare Admin for a Protected Folder is not required, you may want to consider establishing one from among the authorized Users or Group Admins. It would be the responsibility of this person to monitor the files and folders in the Protected Folder, add and remove users and Group Admins, and to make sure that the activity in the Protected Folder is going as planned.

Because all Authorized Users can add or remove files, folders, and (in some cases) users, it is possible that, over time, files are inappropriately added or removed from the Protected Folder, or Users are inappropriately added or removed.

The Admin of a protected folder should monitor Users and the Protected Folder for these problems and fix them if they occur.

"Blacklisted" and "Whitelisted" Files, Folders, and Applications

Certain files, folders, and applications can be "blacklisted" or "whitelisted." Black- or whitelisted items are either forced to be protected, or are never protected.

"Blacklisted" and Other Files You Cannot Protect

PGP NetShare does not allow you to protect certain files and folders. Before a file or folder is protected by PGP NetShare, it is checked against this list, known as the "blacklist." If a file or folder is identified as being blacklisted, PGP NetShare continues with creating the Protected Folder, but the file and/or folder is skipped and a message is displayed in the PGP NetShare Assistant Progress screen that the item is a blacklisted.

Files that are blacklisted include:

- All files with the file extension `*.skr`, `*.pkr`, and `*.pgd`, to prevent you from encrypting your keys or PGP Virtual Disks.
- The PGP Desktop installation folder and all files within it (by default, the folder is located at `C:\Program Files\PGP Corporation\PGP Desktop`).
- The PGP Preferences folder and all files within it (by default, the folder is located in your user folder at `C:\Documents and Settings\[your user name]\Application Data\PGP Corporation\PGP`).
- The PGP default keyring folder (by default, the keyring is located in the My Documents folder).

Other files that PGP NetShare prevents from adding to Protected Folders are any files or folders that have the System attribute set, and all files and folders in the Windows installation directory (by default, `C:\Windows` and `C:\Windows\System32`), as well as the `Thumbs.db` file created when viewing thumbnail graphics in Windows Explorer. When system files or folders are added to PGP NetShare, the file and/or folder is skipped and a message is displayed in the PGP NetShare Assistant Progress screen that the item is a system file or folder.

"Blacklisted" and "Whitelisted" Folders Specified by PGP Universal Server

If you are using PGP Desktop in a PGP Universal Server-managed environment, your PGP administrator may have specified certain folders as "blacklisted" or "whitelisted."

Blacklisted folders

Blacklisted folders are folders that are *never* added to PGP NetShare and encrypted. An example of a blacklisted folder may be your `C:\Program Files` folder or your `C:\Windows\Temp` folder. If your PGP administrator has specified that a folder be blacklisted and that folder does not exist, it is not created on your system.

Note: Folders and/or files that have been PGP NetShare-protected are not decrypted automatically if they are blacklisted (by PGP Universal Server policy). To remove PGP NetShare protection, manually decrypt the folder/file. Any new objects added to a protected blacklisted folder will not receive PGP NetShare encryption.

Whitelisted folders

Whitelisted folders are folders that are *always* added to PGP NetShare and the contents are encrypted. If your PGP administrator has specified that a folder be whitelisted and that folder does not exist, it is created on your system. For example, if your PGP administrator specified that `C:\Documents and Settings\[user name]\My Documents\secured` is a whitelisted folder, and the subfolder `\secured` does not exist, then it is created. You cannot remove whitelisted folders from PGP NetShare.

Note: If you remove a folder that your PGP Universal administrator has specified as whitelisted, that folder is automatically recreated the next time you access PGP NetShare or restart PGP Desktop.

Application-based Encryption and Decryption Bypass Lists

If you are using PGP Desktop in a PGP Universal Server-managed environment, your PGP Universal Server administrator may have specified certain applications as those where files created by these applications are either never decrypted or always encrypted.

Application-based Encryption List

Applications in this list are applications where any files written by the application are forced to be encrypted. Files created by applications in the application-based encryption list are automatically encrypted to your key and are always encrypted regardless of location, including temporary files and system caches. Examples of the types of applications that may be included in this list are Microsoft Office, Microsoft Excel, and Adobe Acrobat.

Other types of encryption (for example, the whitelisted folders) take precedence over files created by applications in the application-based encryption list.

An example use would be if your PGP administrator specified that Microsoft Excel is in the application-based encryption lists so that all spreadsheets created by your Financial department are protected.

Decryption Bypass List

Applications in this list are applications where any files written by the application are prevented from being automatically decrypted. These applications are provided the on-disk file contents, including the PGP NetShare header and file ciphertext. Applications in the decryption bypass list effectively bypass the PGP NetShare filter when reading file, so the files remain encrypted on read, allowing these applications to pass the encrypted data to other applications. Examples of the types of applications that may be included in this list are backup and FTP programs.

Other types of encryption (for example, the blacklisted folders) take precedence over files created by applications in the decryption bypass list.

An example use would be if your PGP administrator specified your corporate backup program in the decryption bypass list. All backup files created by this application are protected and the encryption is preserved when the backup file is transferred to another location.

Working with Protected Folders

The Protected Folder is any folder designated to hold protected files. Files that are in a folder converted to a Protected Folder are automatically encrypted; files moved into a Protected Folder after its creation are encrypted when they are added. You can also protect individual files by selecting **Protect Individual Files** in the NetShare tab of **Tools > PGP Options**.

Starting with PGP NetShare version 9.10, folders on Web servers that support the WebDAV protocol, such as Microsoft SharePoint, can be PGP NetShare-protected. Note that certain types of files, such as `.mht` files, are needed by SharePoint to function correctly and when used in that context, cannot be encrypted by PGP NetShare. For technical details on protecting SharePoint files, see *PGP Corporation Support KB article #1120* (http://support.pgp.com/?faq=1120).

When using PGP NetShare with Sharepoint, be sure to set the option for **Require Checkout** to **No** for the Sharepoint site. This allows all authorized users to access all files that are being managed by the PGP NetShare folder.

Tip: Be sure that you have an appropriate back up strategy in place and that all PGP NetShare protected folders are backed up on a regular basis.

Choosing the Location for a Protected Folder

PGP Corporation recommends that you create your PGP NetShare Protected Folder in a space that is accessible to all Authorized Users, but that is protected from everyone else.

While you can create the Protected Folder in a publicly accessible space, remember that PGP NetShare does *not* provide access control for the files in a Protected Folder.

What you do with the files in a Protected Folder and who can access them impacts the protection PGP NetShare can provide. You should take the following circumstances into consideration when choosing the location for a PGP NetShare Protected Folder.

- *Normal Usage* (on page 223)
- *File Access* (on page 224)
- *Direct Access to Ciphertext* (see "Direct Access to Encrypted Data (Ciphertext)" on page 224)
- *Protected Files Corrupted, Deleted, or Overwritten* (on page 224)
- *"Blacklisted" and Other Files You Cannot Protect* (on page 220)

Normal Usage

In normal usage by an Authorized User, PGP NetShare fully protects the files within a Protected Folder. Normal usage means opening a protected file, making changes, then saving it; creating a new file in a Protected Folder; or moving or copying a file into a Protected Folder.

When a file is moved or copied out of a PGP NetShare Protected Folder, PGP NetShare attempts to keep the file protected. This allows you to copy files from a Protected Folder to a USB drive, for example, and retain the file's protection. If you move or copy a file out of a Protected Folder, you should always verify that the destination file is still protected by looking for the visual lock indicator or examining the file properties.

File Access

Every application you use will have full access to the decrypted data of your PGP NetShare-protected files. This includes other PGP Corporation applications, such as PGP Zip. So, if you create a PGP Zip archive and include a PGP NetShare-protected file, the PGP Zip archive will contain a decrypted version of the file.

Be aware also that if you choose **Save As** for a protected file, and save it *outside* the Protected Folder, the new version will *not* be protected.

Direct Access to Encrypted Data (Ciphertext)

There are some circumstances where PGP NetShare can be bypassed, providing direct access to the encrypted data, or ciphertext, of the encrypted file.

This allows the protected files on a file server, for example, to be backed up, moved, copied, or FTP'd by a user (such as the network administrator) who has physical access to the protected files but who does not have PGP Desktop installed. In these cases, the ciphertext of the protected files would be backed up, moved, copied, or FTP'd.

Protected Files Corrupted, Deleted, or Overwritten

PGP NetShare does *not* provide file access control. Even though users without proper authorization are unable to open files within Protected Folders, it is still possible for these users to access them. This means that even protecting files with PGP NetShare is no assurance that they cannot be corrupted, deleted, or overwritten by users who have access to them. PGP NetShare protects the contents of a file—it cannot protect the file itself.

It is highly recommended that you keep strong file access controls in place—in addition to the cryptographic access control and protection offered by PGP NetShare.

Creating a New PGP NetShare Protected Folder

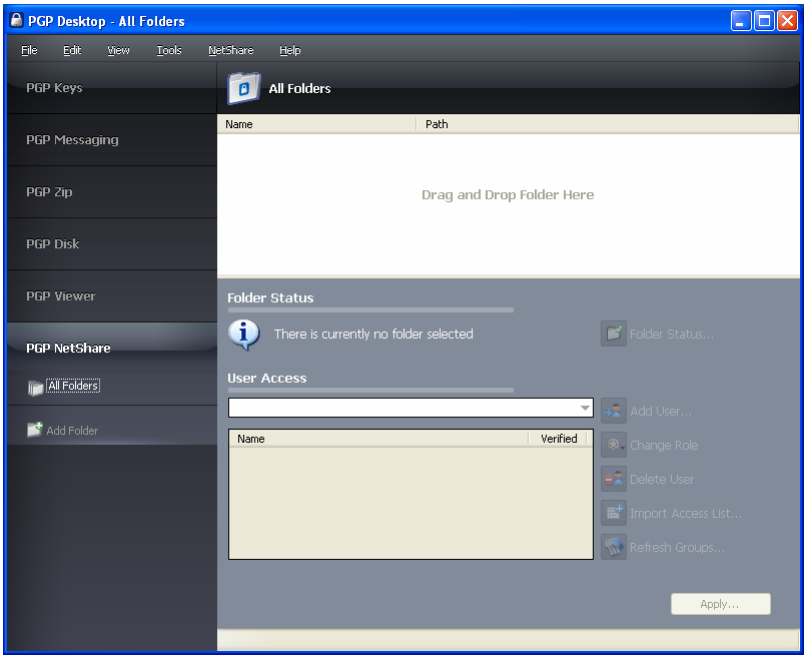
The Protected Folder is the folder that holds the PGP NetShare-protected files.

Tip: When you create a new PGP NetShare Protected folder, the files already in the folder will have their last modification dates changed to the date of the PGP NetShare operation. If you want to preserve the modification dates, *first* create an empty PGP NetShare folder and *then* add files to it.

Note: You must have write-permissions to create a PGP NetShare Protected Folder.

To create a new PGP NetShare Protected Folder

1 Open PGP Desktop and click on the PGP NetShare Control Box. The PGP NetShare work area is displayed.



2 Do one of the following:

- Drag the folder you want to be the Protected Folder to the field labeled "Drag and Drop Folder Here," which opens the PGP NetShare Assistant and skips the step of specifying the Protected Folder.
- Click **Add Folder** in the PGP NetShare Control Box or select **NetShare > Add Folder**. The Select Folder screen of the PGP NetShare Assistant is displayed.
  - Click **Browse**. The Browse For Folder dialog box is displayed.
  - Navigate to the folder with the files you want to include in the Protected Folder you are creating. To create an empty folder into which you will put the files you want to be part of the Protected Folder, click **Make New Folder**.
  - Click **OK** to close the **Browse For Folder** dialog box. The **Select Folder** screen is displayed again.
- (Optional) In the **Description** field, type a description for the Protected Folder you are creating.

3 Click **Next**. The Add Users screen is displayed.

4 To add users for the Protected Folder you are creating, click the down arrow icon. A list of the keys on your keyring is displayed.

5 Select a user, and then click **Add**.

Note: If you want access to the contents of the Protected Folder, do not forget to add your own key. If you do not, you will not be able to use the files in the Protected Folder.

You can also add authorized users by clicking **Add**. The User Selection dialog box is displayed.

6 Do one of the following:

- Drag keys from the **Key source** column into the **Keys to add** column.
- Click on a key in the **Key source** column and click **Add**.
- Double-click on a key in the **Key source** column
- Add keys from the PGP Global Directory, by clicking the PGP Global Directory icon, typing a search term in the **Search** field, then clicking the magnifying glass to start the search. The results of the search appear in the **Key source** column; from there, add them to the **Keys to add** column.

Note: PGP NetShare does not automatically notify newly added members that they have been added to a Protected Folder as authorized users. Generally speaking, it is the responsibility of the creator of a new Protected Folder to notify members that the Protected Folder has been created and that they are authorized users.

7 Click **OK** when you are finished with the User Selection screen. The **Add Users** screen is displayed again.

8 To assign roles to each user, right-click the user's name and select the role:

- **Admin**: Create only one Admin per PGP NetShare protected folder. This role has full read/write rights to the folder, can add and remove users, assign roles to other users, and can promote another user to be the Admin.
- **Group Admin**: Create as many Group Admins as you need for each PGP NetShare protected folder. This role has full read/write rights to the folder, can add and remove users, and assign roles to other users.
- **User**: Create as many Users as you need for each PGP NetShare protected folder. This role has full read/write rights to the folder.

You can change a user's role at any time after the protected folder is created. Click on the protected folder in the PGP Desktop, and right-click the user's name to change the role.

9 Click **Next**. The Select Signer screen is displayed.

10 Select one private key from the private keys on the local keyring. This key will be used to sign the files that are protected by encryption in the Protected Folder.

11 Type the **Passphrase** for the key.

12 Click **Next**. The Progress screen is displayed.

The files in the specified Protected Folder are encrypted and the specified users are added as Authorized Users.

Note: If you cancel the encryption process, files that have already been encrypted remain encrypted. To return the files to their original, unencrypted state, see *Removing a Folder* (see "Decrypting PGP NetShare-Protected Folders" on page 236).

13 When the process is done, click **Finish**.

Using Files in a PGP NetShare Protected Folder

Once you are a PGP NetShare Authorized User, there are three ways to use the files in the Protected Folder:

- Double-click the Protected Folder to open it, then double-click the specific file you want to use.
- Open the file you want to use from within the application that created it.
- Open the Protected folder by clicking its path, which displays as a hypertext link; then double-click the specific file you want to use.

If the passphrase of the private key used for your membership in the PGP NetShare Protected File is cached on your system, you do not need to do anything else to open the files; they will open automatically.

If your passphrase is not cached, however, the Protected Folder is locked. You will need to authenticate before you can open the files in the Protected Folder. For more information, see *Unlocking a Protected Folder* (on page 227).

Note: When opening a PGP NetShare-protected text document on Windows Vista using Notepad, you will receive two notifications that the file is being unlocked. This is a result of how Notepad accesses the file.

Unlocking a Protected Folder

Use the **Unlock** button to try to access a folder that you cannot seem to access but believe you should be able to unlock, or in situations where a folder requires manual unlocking. You must manually unlock a Protected Folder when the folder is locked due to one of the following reasons:

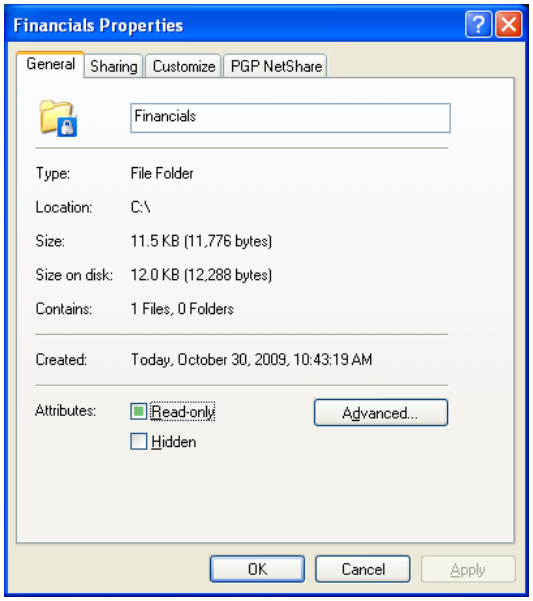
- The timer in the Passphrase prompt dialog box expires.
- If you click **Cancel** in the Passphrase dialog box without entering a valid passphrase.

Any subsequent attempts to access the protected folder result in an "Access is denied" dialog box and you must unlock each Protected Folder before you can use the files in them.

To unlock a Protected Folder

1 Right-click the Protected Folder and select **PGP Desktop > PGP NetShare Properties**.

2 The PGP NetShare Properties tab is displayed.



3 Click **Unlock**. The **Unlocking** dialog box is displayed.

4 Type the appropriate passphrase, then click **OK**. The Unlocking dialog disappears. Your passphrase is cached and you have access to all files in the Protected Folder.

Note: If your PGP Universal Server administrator has enabled the option, you can select **Rescan NetShare Locks** from the PGP tray menu. Use this option to unlock a PGP NetShare protected folder when your key is on a smart card or token that was not inserted when you attempted to access the folder.

Determining the Files in a Protected Folder

Once you become an Authorized User, you have full access to all files in the Protected Folder. If you created the Protected Folder, you probably know what files are in it. If you were added to the Protected Folder by another member, however, it may not be immediately clear to you what files are available to you in the Protected Folder.

To determine what files are in a Protected Folder:

1 Open PGP Desktop and click on the PGP NetShare Control Box.

2 Click the path to the Protected Folder, which is displayed as a hypertext link. The Protected Folder contents appear in a new window, showing the files and folders that are in the Protected Folder.

If access is denied, it means the Protected Folder is locked. You will need to either go to the PGP NetShare tab of the Properties screen for the locked folder and unlock it or restart your system to gain access. For more information about unlocking a Protected Folder, see *Using Files in a PGP NetShare Protected Folder* (on page 227).

Adding Subfolders to a Protected Folder

PGP NetShare supports adding both files and folders into a Protected Folder after it has been created.

All of the files in a folder you add into a Protected Folder will automatically be protected; once added to the Protected Folder, both the folder and the files in it will only be available to authorized users.

Be sure not to add a folder that is already a Protected Folder for a different set of authorized users. This would cause the new subdirectory to have a different set of authorized users from the parent folder.

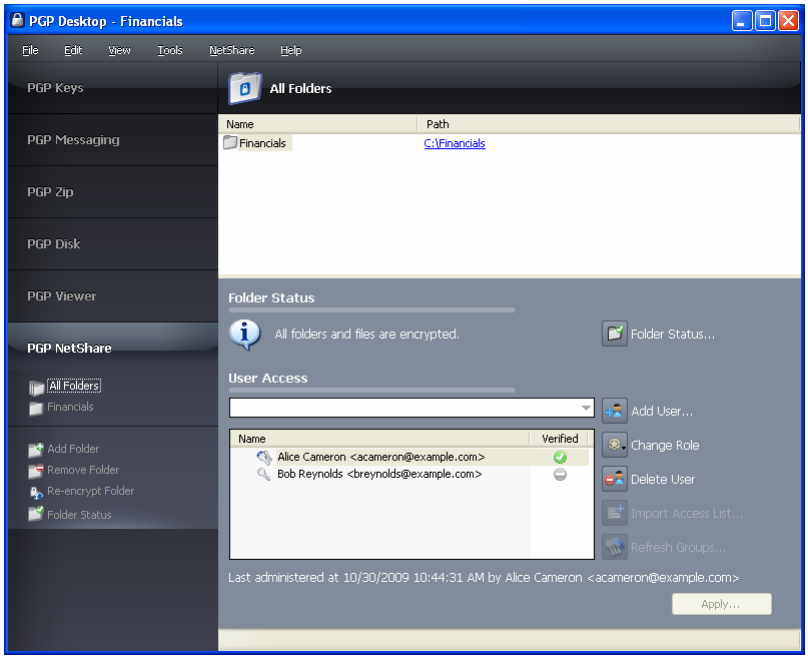
Note: The PGP NetShare tracking engine ignores EFS-protected objects. This is by design and ensures any complications are avoided due to the fact EFS is tightly coupled with NTFS. Any files or folders that are EFS-encrypted and are moved or copied into a PGP NetShare-protected folder retain their EFS-encryption, but do not become PGP NetShare-protected. To PGP NetShare protect these objects, remove the EFS encryption before moving/copying into a folder.

Checking Folder Status

The **Check Folder Status** command, available from the NetShare Folder work area, the PGP NetShare Control Box, or from the NetShare menu, provides up-to-date information about the status of the specified PGP NetShare folder.

To check the status of a folder in a Protected Folder

1 On the PGP NetShare work area, in the Folder Status section, click **Check Folder Status**. You must have a PGP NetShare folder selected.



2 Read the text to the left of the **Check Folder Status** button for the status of the selected folder (for example: "All folders and files are encrypted").

Tip: The date, time, and Key ID of the person who last administered the protected folder are displayed below the user list.

Copying Protected Folders to Other Locations

You will achieve greatest security if you always work within a protected folder; PGP Corporation recommends that when you need to copy a folder, you must first create a Protected Folder as your destination. Whenever you move files from a Protected Folder to another Protected Folder, your environment will remain protected.

PGP NetShare retains file encryption even when the Protected Folder is moved to another location. However, depending on how you copy the files, and where, you may discover that the process has caused the *folder* to lose its protection. The files in the folder retain their protected status, but the folder may lose its PGP NetShare information, and thus lose its PGP icon as well.

If you have copied a folder to an unprotected location, as a best practice, check the folder status as described in *Checking Folder Status* (on page 229) to ensure the folder and files are encrypted.

If the folder is not encrypted, do the following:

1. If your PGP NetShare permissions allow you to do so, create a new protected folder at the destination as described in *Creating a New PGP NetShare Protected Folder* (on page 224).
2. Copy the contents of the folder that has lost its protection into the new protected folder.
3. Import the access list of the old folder into the new folder as described in *Importing PGP NetShare Access Lists* (on page 234).

Working with PGP NetShare Users

Anyone with a PGP Desktop 9.5 or later who has an appropriate keypair in PGP Desktop can be a user of a PGP NetShare Protected Folder.

Keypairs can be:

- Created in PGP Desktop
- Created by an OpenPGP application and imported into PGP Desktop
- An X.509 certificate that has been imported into PGP Desktop

There are two ways to become a user:

- You can create a Protected Folder using PGP Desktop and add yourself as a user.
- You can be added as a user by an existing member.

Once you become a user, you have the same rights as all other users.

Adding a PGP NetShare User

Most PGP NetShare Users are added when the Protected Folder is created, but you can add members at any time after creation—as long as you are an Admin or Group Admin of that Protected Folder.

Caution: Be careful who you add as a User to a PGP NetShare. Once a person is added, that person has all the rights and privileges as any other user. The new member can add new files to, or remove existing files from, the Protected Folder.

To add a new PGP NetShare User

1. Select the PGP NetShare folder to which you want to add a new member.
2. In the User Access section, click **Add User**. The User Selection dialog box is displayed.
3. Do one of the following:

- Drag keys from the **Key source** column into the **Keys to add** column.
- Click on a key in the **Key source** column and click **Add**.
- To add keys from the PGP Global Directory, click the PGP Global Directory icon, type a search term in the **Search** field, then click the magnifying glass or press **Enter** to start the search. The results of the search appear in the **Key source** column; from there, add them to the **Keys to add** column.

Note: PGP NetShare does not notify new members that they have been added as an Authorized User. Generally speaking, it is the responsibility of the person who adds a new user to tell them that they are now authorized.

4. Click **OK**. The user is added to the list of Users.
5. Click **Apply**. The Select Signer screen is displayed.
6. Select one private key from the private keys on the local keyring or accept the default key. This key will be used to sign the files when they are re-encrypted. Re-encryption of the files in a Protected Folder is done automatically as a security precaution when Users are added.
7. Type the passphrase for the selected key, if it is not cached, then click **Next**. The Progress screen is displayed and the files in the specified Protected Folder are re-encrypted.
8. Click **Finish**.

Changing a User's Role

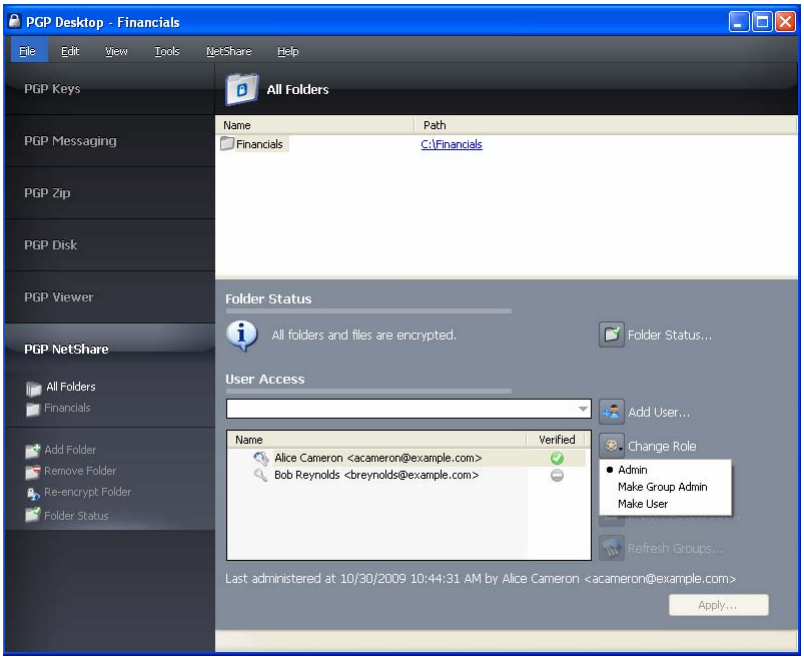
You can change a user's role at any time after the protected folder is created. For more information on roles, see *PGP NetShare Roles* (on page 218).

To change a User to an Admin or Group Admin, be sure that user has full rights to the protected folder.

To change a user's role

1. In PGP Desktop, select the PGP NetShare folder to which you want to add a new member.

2 In the User Access section, select the user's name and click **Change Role**.



Tip: You can also right-click the user's name and select the role.

3 From the list displayed, select the role you want to apply to this user:

- **Admin**: Create only one Admin per PGP NetShare protected folder. This role has full read/write rights to the folder, can add and remove users, assign roles to other users, and can promote another user to be the Admin.
- **Group Admin**: Create as many Group Admins as you need for each PGP NetShare protected folder. This role has full read/write rights to the folder, can add and remove users, and assign roles to other users.
- **User**: Create as many Users as you need for each PGP NetShare protected folder. This role has full read/write rights to the folder.

4 Click **Apply** to save your changes.

Deleting a User from a Protected Folder

To remove a member of a PGP NetShare Protected Folder, you must delete that user.

To delete a user from a PGP NetShare Protected Folder

1 On the PGP NetShare screen, select the Protected Folder from which you want to delete the user.

2 In the User Access list near the bottom of the screen, click on the name of the user you want to delete, then click **Delete User**. The user is deleted from the list.

3 Click **Apply**. The Select Signer screen is displayed.

4 Select one private key from the private keys on the local keyring or accept the default key. This key will be used to sign the files when they are re-encrypted. PGP NetShare automatically re-encrypts files in a Protected Folder as a security precaution when a member is removed from the Protected Folder.

5 If you are prompted to do so, type the passphrase for the selected key, then click **Next**. The Progress screen is displayed and the files in the specified Protected Folder are re-encrypted.

6 Click **Finish**. The deleted user is no longer a member of the Protected Folder and will not be able to access the files in it.

Importing PGP NetShare Access Lists

Importing access lists lets you import the set of members and their keys from one set of Authorized Users of which you are a member to another set of Authorized Users of which you are a member.

This option is available only when you have more than one Protected Folder.

To import an access list

1 On the PGP NetShare screen, select the Protected Folder into which you want to import the members of another Protected Folder.

2 In the **User Access** list near the bottom of the screen, click **Import Access List**. The PGP Import User Access List dialog box is displayed.

3 Click the name of the existing Protected Folder whose members you want to import, then click **Import**.

4 Click **Apply**. The Select Signer dialog box is displayed.

5 Select one private key from the private keys on the local keyring or accept the default key. This key will be used to sign the files when they are re-encrypted. Re-encryption of the files in a Protected Folder is done automatically as a security precaution when membership in that folder is modified.

6 If you are prompted to do so, type the passphrase for the selected key, then click **Next**. The Progress screen is displayed and the files in the specified Protected Folder are re-encrypted.

7 Click **Finish**. The new members are added to the Protected Folder.

Working with Active Directory Groups

PGP NetShare integrates with Active Directory so you can easily assign users to Protected Folders an Active Directory group. PGP NetShare uses LDAP (Lightweight Directory Access Protocol) to retrieve group information from your organization's Active Directory.

Setting up PGP NetShare to Work with Groups

In order to retrieve group information, you must bind to your PGP Universal Server and then enable the **Use for Group Expansion** option. The following procedures describe these steps if you have installed PGP Desktop in a standalone environment. If PGP Desktop is installed and integrated with a PGP Universal Server environment, you do not need to follow this procedure, as LDAP integration is automatic.

Note: There is a limit as to the number of users you can add at one time to a PGP NetShare folder (50 users). Although it is possible to customize this hard coded limit, there are implications for doing so and this should not be attempted without obtaining support from PGP Corporation For more information, see the *PGP Support Knowledgebase Article 830* (https://support.pgp.com/?faq=830).

To set up PGP NetShare to work with groups

1. Add the PGP Universal Server to your list of Preferred Keyservers. To do this, create a new messaging service and specify the name of your PGP Universal Server. For more information, see *Creating a Service and Editing Account Properties* (see "Creating a New Messaging Service" on page 94).
2. Bind to the PGP Universal Server. To do this, follow the instructions to manually bind to a PGP Universal server in *Messaging with Lotus Notes and MAPI* (see "Using PGP Desktop with IBM Lotus Notes" on page 313).
3. In the PGP Key Generation assistant, select the key mode as GKM, CKM, or SCKM. Do not select SKM.
4. Verify that the key is available on the PGP Universal Server. To do this, in PGP Desktop, select the PGP Keys Control Box. Click **Search for Keys**, select the name of the PGP Universal Server, enter your name, and click **Search**.
5. Enable group expansion. To do this, in PGP Desktop, select the PGP Messaging Control Box.
6. Choose **Messaging** > **Use for Group Expansion**. A check is displayed next to the menu item to indicate it is enabled.

Refreshing Groups

If you are using PGP NetShare in a PGP Universal Server-managed environment, and your PGP administrator has established Active Directory groups, you can have PGP NetShare verify that group memberships are up to date.

To refresh Active Directory groups

1. On the PGP NetShare screen, select the Protected Folder whose Active Directory groups you want to refresh.
2. In the **User Access** section, click **Refresh Groups**. PGP NetShare checks the Active Directory group memberships and refreshes them if necessary.

Decrypting PGP NetShare-Protected Folders

The Remove Folder command restores the files in a Protected Folder to their normal, decrypted state.

All folders and files that are part of the Protected Folder are decrypted; the PGP icon overlay on the files will be removed.

To remove protection from a PGP NetShare Protected Folder

1. On the PGP NetShare screen, select the Protected Folder whose protection you want to remove.
2. In the PGP NetShare Control Box, on the left side of the PGP Desktop window, click **Remove Folder**. The Confirm Decryption dialog box is displayed.
3. Verify that you are removing protection from the desired folder, then click **Next**. The Unlocking Folder dialog is displayed, if your passphrase has not been cached.
4. Type the passphrase of one of the keys to which the files were encrypted, then click **OK**. You must type an appropriate passphrase in the allotted time or the decryption process will be cancelled. The Progress screen is displayed and the files are decrypted.
5. Click **Finish**. The files in the Protected Folder are no longer protected by encryption, it is removed from the PGP NetShare Protected Folder list, and its lock icon disappears.

Tip: You can also decrypt a folder by right-clicking the folder in Windows Explorer and selecting **Remove Folder from PGP NetShare** from the shortcut menu.

Re-Encrypting a Folder

Re-encrypting a folder re-encrypts the files in the specified Protected Folder. Re-encryption changes the underlying key, preventing access to anyone who might have been able to determine the current key. You must be a Group Admin or Admin of the folder in order re-encrypt that folder.

The Re-encrypt Folder command lets you re-encrypt whenever you want; for example, if you believe an unauthorized person has gained access to the files in the Protected Folder.

Examples of why you might want to re-encrypt:

- You are concerned some Protected Folder contents are not encrypted; for example, if someone who is not an Authorized User places a file in a Protected Folder.
- The key information of an Authorized User has been compromised.
- A new Authorized User is added, and needs access to the Protected Folder (this does not happen automatically).

To re-encrypt a Protected Folder

1. On the PGP NetShare screen, select the Protected Folder you want to re-encrypt.
2. In the PGP NetShare Control Box, on the left side of the PGP Desktop window, click **Re-encrypt Folder**. The Add Users screen is displayed.

   You can add new members to or remove existing members from a Protected Folder that is being re-encrypted.
3. Click **Next** to continue. The Select Signer screen is displayed.
4. Select one private key from the private keys on the local keyring or accept the default key. This key will be used to sign the files when they are re-encrypted.
5. If you are prompted to do so, type the passphrase and then click **Next**. The Progress screen is displayed and the files in the specified Protected Folder are re-encrypted.
6. Click **Finish**. The re-encryption process is complete.

Clearing a Passphrase

By default, PGP NetShare caches passphrases according to the settings on the General tab of the PGP Desktop Options. This can make it easier to use PGP NetShare, as you do not need to type your passphrase to use the protected files in the Protected Folder.

However, if you are going to be leaving your system, you may not want to leave it with your passphrase cached, as this might let an unauthorized person perform actions without needing the passphrase.

To clear a passphrase

1. In Windows, click the PGP icon in the System Tray.
2. Select **Clear Caches** from the menu displayed. At least one passphrase must be cached for this command to be active. Your cached passphrases are cleared.

Protecting Files Outside of a Protected Folder

PGP NetShare has an advanced option that lets you protect individual files that are *not* in a PGP NetShare Protected Folder. This option is disabled by default.

Note: You may be prevented from selecting this option by your PGP administrator if you are using PGP Desktop in a PGP Universal Server-managed environment.

To protect individual files outside of a PGP NetShare Protected Folder, you must first select the **Protect individual files** option on the NetShare tab of the PGP Options; for more information, see *PGP NetShare Options* (on page 293). You cannot protect files that are outside of a PGP NetShare Protected Folder until this option is enabled.

Once you select the **Protect individual files** option, you can protect individual files that are outside of a Protected Folder using the PGP Desktop shortcut menu in Windows Explorer. *Individually protected files do not appear in the PGP NetShare Work area of the PGP Desktop user interface.*

Caution: PGP NetShare makes every effort to protect individually protected files, but some applications (Microsoft Word, for example) save modified files in such a way that it appears to PGP NetShare that the protected file has been deleted. Under such circumstances, PGP NetShare cannot continue to protect these files. Note that this applies only to individually protected files that are not in a Protected Folder, not files in a PGP NetShare Protected Folder. To avoid having protected files become unprotected, PGP Corporation strongly recommends that you keep files you want protected in a PGP NetShare Protected Folder.

To enable the Protect individual files option

1. Select **Tools > PGP Options**.
2. Click the **NetShare** tab.
3. On the NetShare tab, make sure the **Protect individual files** option is selected. The default setting is *not* selected.

To protect individual files using PGP NetShare

1. In Windows Explorer, right-click the file you would like to protect using PGP NetShare.
2. In the shortcut menu, select **PGP Desktop > Add [file name] to PGP NetShare.**
3. When the PGP NetShare Assistant is displayed, add Authorized Users and select a private key for signing.
4. When the encryption process is complete, click **Finish**. The protected file displays a PGP NetShare icon in Windows Explorer.

You can also use the shortcut menu to view the PGP NetShare properties of a protected file, re-encrypt individually protected files that are outside of a Protected Folder, and remove protection from them.

To view the PGP NetShare properties of a protected file using the shortcut menu

1. In Windows Explorer, right-click the protected file whose PGP NetShare properties you would like to view.
2. In the shortcut menu, select **PGP Desktop > PGP NetShare Properties.** The Properties window for the selected file is displayed.
3. When done viewing properties, click **OK**.

To re-encrypt protected files using the shortcut menu

1. In Windows Explorer, right-click the protected file you would like to re-encrypt.

2 In the shortcut menu, select **PGP Desktop > Re-encrypt.**

3 When the PGP NetShare Assistant is displayed, add and/or remove Authorized Users and select a private key for signing.

4 When the re-encryption process is complete, click **Finish**.

To remove protection from individually protected files using the shortcut menu

1 In Windows Explorer, right-click the protected file whose protection you would like to remove.

2 In the shortcut menu, select **PGP Desktop > Remove [file name] from PGP NetShare**.

3 When the PGP NetShare Assistant is displayed, confirm that you want to remove protection from the file by clicking **Next**.

4 When the file has been decrypted, click **Finish**.

Backing Up PGP NetShare-Protected Files

You can back up files and folders that have been protected by PGP NetShare. Whether you are using PGP NetShare in a PGP Universal Server managed environment or not determines how the files are handled during the backup process.

Backing up files with an unmanaged client

When an unmanaged (standalone) client backs up protected files and folders, the protected files are decrypted transparently during backup and are stored in the clear on the backup media. Restoring them to their original encryption will encrypt them again transparently.

Backing up files with a PGP Universal Server-managed client

When a managed client is used to back up of protected files and folders, how the encryption is handled depends on if the backup application is set as an application bypass by the PGP Universal Server administrator.

- If the backup application is part of the decryption bypass list, the protected files stay encrypted on the backup media after backup. Restoring them to their original location keeps them encrypted.

- If the backup application is not part of the decryption bypass list, then it is similar to backing up files with an unmanaged client. In this case, the protected files are decrypted transparently during backup and are stored in the clear on the backup media. Restoring them to their original encryption will encrypt them again transparently.

Note: PGP Corporation recommends that you do not mix the different scenarios between backing up data and restoring data. For example, if you are using an unmanaged client to back up the files, an unmanaged client should restore the files.

Accessing PGP NetShare Features using the Shortcut Menu

Some PGP NetShare functionality is available from the right-click shortcut menu in Windows Explorer.

You can protect folders (and files, if you have enabled the **Protect individual files** option) from Windows Explorer by right-clicking the item. Select **PGP Desktop > Add [name] to PGP NetShare** from the shortcut menu displayed to begin the process of designating that item as protected by PGP NetShare.

For more information about protecting individual files outside of a Protected Folder using PGP NetShare, see *Protecting Files Outside of a Protected Folder* (on page 238).

Once a folder or file is protected by PGP NetShare, there are three commands you can perform in Windows Explorer using the shortcut menu:

- **PGP NetShare Properties**. This command opens the PGP NetShare tab of the Properties screen for the file or folder. On this tab, you can view who can use protected files, unlock a file/folder if locked, and add users who can use the protected files.
- **Re-encrypt**. This command re-encrypts the specified folder or file to a new underlying key.
- **Remove <file name> from PGP NetShare**. This command removes the PGP NetShare protection from the specified folder or file.

For the applicable procedures, see *Protecting Files Outside of a Protected Folder* (on page 238).

PGP NetShare in a PGP Universal Server-managed Environment

If you are using PGP NetShare in a PGP Universal Server-managed environment, your PGP administrator may have configured settings that affect how PGP NetShare works on your system.

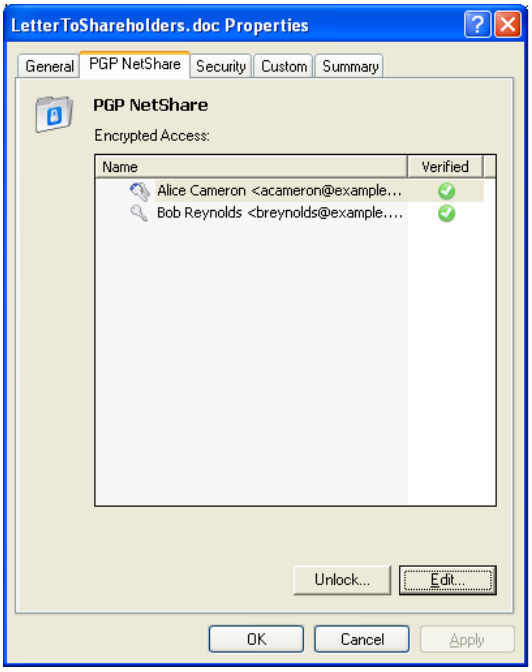
These settings are:

- **Allow the user to create and manage PGP NetShare folders**. When enabled, this setting allows you to create PGP NetShare Protected Folders. When disabled, you can use a Protected Folder that someone else has created, but you cannot create one yourself. This setting is enabled by default.
- **Allow the user to enable Advanced User mode**. When enabled, this setting allows you to enable Advanced User mode in your PGP Options, which means that you can protect individual files that are moved out of a Protected Folder. This setting is disabled by default.
- **Force the encryption of files in the following folders**. These folders are called "whitelisted" folders. Whitelisted folders are folders that are *always* added to PGP NetShare and the contents are encrypted. For more information, see *"Blacklisted" and "Whitelisted" Folders Specified by PGP Universal Server* (on page 221).
- **Prevent the encryption of files in the following folders**. These folders are called "blacklisted" folders. Blacklisted folders are folders that are *never* added to PGP NetShare and encrypted. For more information, see *"Blacklisted" and "Whitelisted" Folders Specified by PGP Universal Server* (on page 221).

Contact your PGP administrator if you have any questions about these settings.

Accessing the Properties of a Protected File or Folder

Any file that is protected by PGP NetShare has a PGP NetShare tab on its Properties screen, which shows information about the file.



To access the PGP NetShare tab on the Properties dialog box of a file

1 In Windows Explorer, do one of the following:

- Right-click the file and select **Properties** from the list.
- Select **File > Properties** from the list.

The Properties screen for the specified file is displayed.

2 Click the **PGP NetShare** tab. The PGP NetShare tab is displayed.

3 The PGP NetShare tab for a file shows you the names of those users who can use the encrypted file. From here you can do one of the following:

- **Unlock**. Click to unlock a Protected Folder that has been locked.
- **Edit**. Click to display the Add Users screen, which lets you add/remove users who can use the selected file/folder. The file/folder will be re-encrypted if a user is added or removed.
- View the roles for each user by right-clicking the user's name. You cannot change the user's role in this tab (to change a user's role, see *Changing a User's Role* (on page 232)).

4 To close the Properties dialog, click **OK**.

Using the PGP NetShare Menus in PGP Desktop

There are three PGP Desktop menus that have commands that affect PGP NetShare: File, Edit, and NetShare.

The File Menu

When the PGP NetShare Control Box is selected, selecting **File > New PGP NetShare Folder** lets you create a new Protected Folder.

The process is the same as described in *Creating a New PGP NetShare Protected Folder* (on page 224).

The Edit Menu

When the PGP NetShare Control Box is selected, the **Rename** command under the PGP Desktop Edit menu lets you rename a Protected Folder.

To rename a PGP NetShare Protected Folder via the Edit menu

1. Open PGP Desktop and click on the **PGP NetShare** Control Box.
2. If you have more than one Protected Folder, click on the name of the Protected Folder you want to rename.
3. Select **Edit > Rename**.
4. Type a new name for the Protected Folder.
5. Press **Enter** or click outside the Protected Folder name. The Protected Folder is renamed.

The **Show File in Explorer...** option in the Edit menu is equivalent to clicking a Protected Folder's path. Choosing this option opens a selected folder in Windows Explorer.

The NetShare Menu

You can select the following commands from the NetShare menu when the PGP NetShare Control Box is selected:

- **Add Folder**: Select this command to create a new Protected Folder. The process is the same as described in *Creating a New PGP NetShare Protected Folder* (on page 224). You must select the PGP NetShare Control Box for this command to be active.

- **Remove Folder**: Select this command to begin the process of taking a Protected Folder and restoring it to its normal, decrypted state. All folders and files that are part of the Protected Folder will be decrypted; the PGP icon overlay on the files will be removed. You must select a Protected Folder for this command to be active.
- **Re-encrypt Folder**: Select this command to re-encrypt the files in a Protected Folder. Re-encryption changes the underlying key, preventing access to anyone who might have been able to determine the current key. Re-encryption is done automatically when a user is added to or removed from a Protected Folder. The **Re-encrypt Folder** command lets you re-encrypt whenever you want; for example, if you believe an unauthorized person has gained access to the files in the Protected Folder. You must select a Protected Folder for this command to be active.
- **Check Folder Status**: Select this command to get up-to-date information about the status of the selected Protected Folder. You must select a Protected Folder for this command to be active.
- **Clear Recent Folder**: Select this command to remove it from the list of Protected Folders. Unlike the **Remove Folder** command, however, this command does not decrypt the files in the Protected Folder. You must select a Protected Folder for this command to be active.

14 Using PGP Zip

Use PGP Zip to create, open, and edit encrypted and compressed packages, called PGP Zip archives. This section describes how to use the PGP Zip feature of PGP Desktop.

Note: If you are using PGP Desktop in a PGP Universal Server-managed environment, your PGP Universal Server administrator may have disabled certain features. When a feature is disabled, the control item in the left side is not displayed and the menu and other options for that feature are not available. The graphics included in this guide depict the default installation with all features enabled. If your PGP Universal Server administrator has disabled this functionality, this section does not apply to you.

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Overview

A PGP Zip Archive package is a single file that is encrypted and compressed for convenient transport or backup. These archive files can hold any combination of files and/or folders, and are especially convenient for secure transport or backup.

Use the PGP Zip Assistant to create new PGP Zip Archive packages. The Assistant guides you through the process of selecting the files and/or folders for your archive and the method of encryption or packaging:

- Encrypting and packaging your files and/or folders using the PGP keys of one or more recipients (recipients must have PGP Desktop on their computers).
- Encrypting and packaging your files and/or folders using a passphrase (recipients must have PGP Desktop on their computers).

- Encrypting and packaging your files and/or folders into a self-decrypting archive (PGP Zip SDA) that is protected by a passphrase (recipients do not need PGP Desktop, but the recipient's computer must be running Microsoft Windows);
- No encryption and no packaging, but a file is created that you can send to your recipients to verify that you are the person who sent the file.

When you are using the PGP Zip Assistant to create a PGP Zip Archive file, you have the option of automatically sending the original files to the PGP Shredder, so they can be removed securely and permanently from your computer.

When you receive a PGP Zip Archive file, you can:

- Extract all of the files and/or folders in the archive.
- Extract some of the files and/or folders in the archive.
- Extract some files and/or folders in the archive while adding others.
- Add new files and/or folders to the archive.
- Edit the archive by:
  - Changing the type of encryption.
  - Changing the signing key.
  - Changing the recipients.

PGP Zip archives are encrypted to the preferred cipher for PGP Desktop (if configured by a PGP Universal Server administrator) or to AES256. PGP Zip Archives can be moved between the Windows and Mac OS X platforms. PGP Desktop must be installed on the system to which the PGP Zip archive is being moved.

Creating PGP Zip Archives

To create a PGP Zip archive

1. Click the PGP Zip Control box and then click **New PGP Zip**. The PGP Zip Assistant is displayed.
2. Do any of the following:
   - Drag and drop your files into the area specified in the assistant.
   - To add an entire directory to the PGP Zip archive you are creating, click **Add directory** .
   - To add a file to the PGP Zip archive you are creating, **Add files** .
   - To remove a file or directory from the PGP Zip archive you are creating, click **Remove selected files** .

- To select additional options for the PGP Zip file that you are creating, click **PGP Zip advanced options** . The default settings are fine for most users.

Note: To add a combination of files and folders, use a combination of the and the buttons. When you add a directory to the file list, the PGP Zip Assistant displays all files separately, making it easy to see all of them. If you need to add many files to your PGP Zip Archive, you might save time if you add an entire directory to the PGP Zip Archive file list first, then remove the files that you do not want included. *If you do this, before proceeding, make sure that you have completely removed any files that are not intended for the PGP Zip Archive.*

3 To securely delete the original files once the PGP Zip Archive is created, select **Send original files to PGP Shredder when finished**.

Caution: If you choose to send the original files to PGP Shredder once the PGP Zip Archive is created, you cannot retrieve your files later—not even with a file recovery utility. Your files are permanently deleted and cannot be recovered. Use care when selecting this option.

4 To specify special options, click **PGP Zip advanced options** :

- To create separate encrypted files rather than one PGP Zip Archive package that contains all files in a single encrypted file, select **Do not Zip (output files individually)**.
- To create zip archives of only text files, select **Convert linefeeds for text files**.
- To create a zip archive that requires the PGP Secure Viewer, if your organization's security policies specify that requirement, select **Require PGP Secure Viewer when decrypting**. If you have selected this mode, when the file is decrypted it is displayed in a PGP Secure Viewer window. Using this option protects against outdated radiation capturing attacks.
- To email this zip archive as a binary file, and you are using an older email application, select **Output Text**. Saving the file as ASCII text increases the size of the encrypted file by about 30%. This option is not available when you are using PGP Desktop in a PGP Universal Server-managed environment.
- To save these PGP Zip Option settings so you can use them in the future, select **Remember these settings next time**.
- Click **OK** when you are done selecting special options. Click **Cancel** if you choose not to change any of these options.

The New PGP Zip dialog box displays again.

5 When you have finished selecting files for your PGP Zip Archive, click **Next**.

6 Select the desired type of encryption and click **Next**.

Tip: Move your cursor over each option to view more details in the information field below the option list.

- **Recipient keys**. Creates a PGP Zip Archive by encrypting the files to the public keys of the recipient(s), ensuring that only those recipients can use PGP Desktop to open the archive. This is the most secure option. See *Encrypting to Recipient Keys* (on page 250).
- **Passphrase**. Creates a PGP Zip Archive by encrypting the files with a passphrase you specify when saving the archive. Only those persons who know the passphrase, and who are using PGP Desktop can open the archive. See *Encrypting with a Passphrase* (on page 252).
- **PGP Self-Decrypting Archive.** Creates a PGP Self-Decrypting Archive with a passphrase you specify when saving the archive. PGP Desktop is not required when decrypting a PGP Self-Decrypting Archive—but recipients *must be* using a computer running the Microsoft Windows operating system. See *Creating a PGP Self-Decrypting Archive (SDA)* (on page 254).
- **Sign Only**. Adds your PGP signature to an unencrypted zip file. Your recipient(s) can then open the zip archive using PGP Desktop, and the included signature verifies that the zip archive came from you and has not been modified in transit. For more information, see *Sign Only* (see "Creating a Sign Only Archive" on page 255).

Note: If you are using PGP Desktop in a PGP Universal Server-managed environment, passphrase (conventional) encryption may be disabled.

Encrypting to Recipient Keys

Use **Recipient keys**:

- To offer the highest possible security for your files.
- When each of your recipients has PGP Desktop installed on their computers (Windows or Mac OS X).
- When you have a public key for each recipient (from your Keyring or a PGP Keyserver).
- When you do not want to reveal a passphrase to file recipients.

Encrypting your PGP Zip Archive by using the public keys of all of your recipients is the most secure option, and should be the first choice if you need top security and have the necessary requirements available.

Once your files are secured, you send the resulting PGP Zip Archive file to your recipients however you choose. Your recipients then use PGP Desktop to open the PGP Zip Archive file. Anyone whose key you included when you encrypted the file can open the resulting PGP Zip Archive file, and everyone sees the same items. If you need to have some recipients see only some items, you must create separate PGP Zip Archive files for each.

To encrypt to recipient keys

1. If you haven't already, begin the process of creating a PGP Zip Archive as described in *Creating PGP Zip Archives* (on page 248).
2. In the Encrypt dialog box, select **Recipient keys**.
3. Click **Next**. The Add User Keys dialog box is displayed.
4. Select the recipients of your PGP Zip Archive. Do any of the following:
   - To select from the list of keys that are on your keyring, click the arrow.
   - To send the file to a recipient whose key is not on your keyring, click **Add.** The Recipient Selection dialog box is displayed.

   When you are finished selecting additional names, click **OK** to return to the **Add User Keys** panel.

   To remove any keys, select the recipient's name and click **Remove**.
5. Click **Next.** The Sign and Save screen is displayed.
6. If desired, specify a private key on your keyring as a Signing Key for the PGP Zip archive being created.

   This specified Signing Key is used to digitally sign the PGP Zip archive. The recipient(s) can verify who the archive is from by verifying the digital signature using the corresponding public key.
   - If you do not need to sign the file, or prefer not to, choose **None** from the Signing Key list.
   - If you choose to sign your PGP Zip Archive, choose your key from the Signing Key list, then enter the passphrase of the key selected for signing (not the passphrase used to secure the zip). To see keystrokes as you type the passphrase, select **Show Keystrokes**.

   If you have already typed your passphrase during this session using PGP Desktop your passphrase might be cached, depending on your **Options** settings. A message is displayed stating that the passphrase is cached, if this is the case. Even if your passphrase is cached, you can still choose not to sign the PGP Zip Archive file.
7. Confirm that the PGP Zip Archive is being saved in the location and with the file name you want. If necessary, you can:
   - Change where the file is saved by clicking **Browse** and choosing a location from the Windows File dialog box.
   - Change where the file is saved by manually typing the location where you would like to save the PGP Zip Archive.
   - Change the PGP Zip Archive file name by manually typing it at the end of the file location text string.

The default file name for a PGP Zip Archive containing a single file, directory, or drive is the name of that item with `.pgp` appended. If the PGP Zip Archive contains more than one item, its file name is one of the items with `.pgp` appended. Change the PGP Zip Archive file name, if desired.

8 If you chose the **Sign Only** option, click to select **Save Detached Signatures**.

9 Click **Next**. The PGP Zip Archive is created.

10 Click **Finish**. Your PGP Zip Archive is ready to be sent to the recipients whose keys you encrypted it to. If your key was one of the keys you used for encryption, the file is ready for storage wherever you want.

Encrypting with a Passphrase

Use **Passphrase**:

- When you want to create a PGP Zip archive without using recipients' keys (this can be less secure than encrypting with recipients' keys, although still highly secure).
- When each of your recipients has PGP Desktop installed on their computers (Windows or Mac OS X).
- When you do want to reveal a passphrase to file recipients.
- When you do not have a public key for each recipient (from your Keyring or a PGP Keyserver).

Tip: Encrypting with a passphrase is also referred to as *conventional encryption*.

Encrypting your PGP Zip Archive with a passphrase can be extremely secure, especially with a strong passphrase. However, encrypting to recipient keys does offer even higher security. When you encrypt to your recipients' keys, those who possess the PGP Zip Archive need both their private keys and passphrases to decrypt the file (and each recipient's private key has its own passphrase).

When encrypting with a passphrase, everyone opens the file using the same passphrase, and no private keys are required. Anyone who possesses the file, uses PGP Desktop and knows the passphrase can decrypt the file.

Caution: Take every possible precaution to ensure that the passphrase to your PGP Zip Archive is revealed to no one but the intended recipients. If the passphrase is revealed to unauthorized persons, create a new PGP Zip Archive with a different passphrase. Note, however that you can do nothing to re-secure the original archive file and its contents.

Once your files are secured, send the resulting PGP Zip Archive file to your recipients however you choose. Your recipients then use PGP Desktop to open the PGP Zip Archive file. *Anyone who has the file and the passphrase can open the resulting PGP Zip Archive file,* and everyone sees the same items. If you need to have different recipients see different items, you must create separate PGP Zip Archive files for each.

Caution: If you are using PGP Desktop in a PGP Universal Server-managed environment, encrypting with a passphrase may be disabled.

To encrypt using a passphrase

1. If you haven't already, begin the process of creating a PGP Zip Archive as described in *Creating PGP Zip Archives* (on page 248). Follow the instructions to Step 6. Once that is completed, return to this section.
2. In the Encrypt window, select **Passphrase**.
3. Click **Next**. The Create a Passphrase dialog box is displayed.
4. To see keystrokes as you type the passphrase, select **Show Keystrokes**.
5. In the **Passphrase** field, type the passphrase you want to use.

   The Passphrase Quality bar provides a basic guideline for the strength of the passphrase you are creating by comparing the amount of entropy in the passphrase you type against a true 128-bit random string (the same amount of entropy in an AES128 key). For more information, see *The Passphrase Quality Bar* (on page 304).
6. Type your passphrase again in the **Confirm** field.
7. Click **Next**. The Sign and Save dialog box is displayed.
8. If desired, specify a private key on your keyring as a Signing Key for the PGP Zip archive being created.

   This specified Signing Key is used to digitally sign the PGP Zip archive. The recipient(s) can verify who the archive is from by verifying the digital signature using the corresponding public key.

   - If you do not need to sign the file, or prefer not to, choose **None** from the Signing Key list.
   - If you choose to sign your PGP Zip Archive, choose your key from the Signing Key list, then enter the passphrase of the key selected for signing (not the passphrase used to secure the zip). To see keystrokes as you type the passphrase, select **Show Keystrokes**.

   If you have already typed your passphrase during this session using PGP Desktop your passphrase might be cached, depending on your **Options** settings. A message is displayed stating that the passphrase is cached, if this is the case. Even if your passphrase is cached, you can still choose not to sign the PGP Zip Archive file.
9. Confirm that the PGP Zip Archive is being saved in the location and with the file name you want. If necessary, you can:

- Change where the file is saved by clicking **Browse** and choosing a location from the Windows File dialog box.
- Change where the file is saved by manually typing the location where you would like to save the PGP Zip Archive.
- Change the PGP Zip Archive file name by manually typing it at the end of the file location text string.

The default file name for a PGP Zip Archive containing a single file, directory, or drive is the name of that item with `.pgp` appended. If the PGP Zip Archive contains more than one item, its file name is one of the items with `.pgp` appended. Change the PGP Zip Archive file name, if desired.

10 Click **Next**. The PGP Zip Archive is created.

11 Click **Finish**. Your PGP Zip Archive is ready to be sent to the recipients. Do not forget to communicate the passphrase to the recipients so they can open the archive.

Creating a PGP Self-Decrypting Archive (SDA)

Use **PGP Self-Decrypting Archive**:

- When you want to create a PGP Zip self-decrypting archive without using recipients' keys (this can be less secure than encrypting with recipients' keys, although still highly secure).
- When your recipients do not have PGP Desktop installed on their computers and all recipients are using Windows systems.
- When you do want to reveal a passphrase to file recipients.
- When you do not have a public key for each recipient (from your Keyring or a PGP Keyserver).

A PGP Self-Decrypting Archive (SDA) is a PGP Zip Archive that can be opened on any Windows computer, even those that do not have PGP Desktop installed. PGP Zip SDA files are standard Windows executable (.exe) files that you an open simply by double-clicking them.

PGP Zip SDA files are slightly larger than regular PGP Zip Archive because the self-decrypting "mechanism" requires a certain amount of extra space (usually about 100 KB).

Note: If you are using PGP Desktop in a PGP Universal Server-managed environment, PGP Zip SDA creation may be disabled.

Once you have created your PGP Zip SDA, send it to your recipients however you choose. *Anyone who has the file and the passphrase can open the resulting PGP Zip Archive file,* and everyone sees the same items. If you need to have different recipients see different items, you must create separate PGP Zip Archive files for each.

Caution: Take every possible precaution to ensure that the passphrase to your PGP Zip SDA is revealed to no one but the intended recipients. If the passphrase is revealed to unauthorized persons, create a new PGP Zip SDA with a different passphrase. Note, however that you can do nothing to re-secure the original archive file and its contents.

To create a PGP Zip SDA

1. If you haven't already, begin the process of creating a PGP Zip Archive as described in *Creating PGP Zip Archives* (on page 248). Follow the instructions to Step 6. Once that is completed, return to this section.
2. In the Encrypt dialog box, select **PGP Self-Decrypting Archive**.
3. Click **Next**. The Create a Passphrase dialog box is displayed.
4. To see keystrokes as you type the passphrase, select **Show Keystrokes**.
5. In the **Passphrase** field, type the passphrase you want to use.

   The Passphrase Quality bar provides a basic guideline for the strength of the passphrase you are creating by comparing the amount of entropy in the passphrase you type against a true 128-bit random string (the same amount of entropy in an AES128 key). For more information, see *The Passphrase Quality Bar* (on page 304).
6. Type your passphrase again in the **Confirm** field.
7. Click **Next**.
8. Confirm that the PGP Zip Archive is being saved in the location and with the file name you want. If necessary, you can:
   - Change where the file is saved by clicking **Browse** and choosing a location from the Windows File dialog box.
   - Change where the file is saved by manually typing the location where you would like to save the PGP Zip Archive.
   - Change the PGP Zip Archive file name by manually typing it at the end of the file location text string.

   The default file name for a PGP Zip Archive containing a single file, directory, or drive is the name of that item with `.pgp` appended. If the PGP Zip Archive contains more than one item, its file name is one of the items with `.pgp` appended. Change the PGP Zip Archive file name, if desired.
9. Click **Next**. The PGP Zip SDA is created.
10. Click **Finish**. Your PGP Zip SDA is ready to be sent to the recipients

Creating a Sign Only Archive

Use **Sign Only**:

- When you do not need to encrypt your files (so you do not need to reveal a passphrase to recipients).
- When you want to generate a signature file that your recipients can use to confirm the PGP Zip Archive came from you. Each file is processed individually and a separate detached sig is created for every file.
- When each of your recipients has PGP Desktop installed on their computers (Windows or Mac OS X).
- When you want to guarantee that you have sent the file, and you want to assure your recipient that the file has not changed during transit.

For times when you do not need to encrypt file(s) for your recipients, you can choose the Sign Only option. Instead of encrypting your files and zipping them into one PGP Zip Archive, this option zips them only.

To encrypt using the Sign Only option

1 If you haven't already, begin the process of creating a PGP Zip Archive as described in *Creating PGP Zip Archives* (on page 248). Follow the instructions to Step 6. Once that is completed, return to this section.

Note: When you are selecting the files to be zipped and signed, the **Send original files to PGP Shredder** option is ignored, even if you select it.

2 In the Encrypt dialog box, select **Sign Only**.

3 Click **Next**. The **Sign and Save** panel is displayed.

4 Specify a private key on your keyring as a Signing Key for the PGP Zip archive being created.

This specified Signing Key is used to digitally sign the PGP Zip archive. The recipient(s) can verify who the archive is from by verifying the digital signature using the corresponding public key.

- If you do not need to sign the file, or prefer not to, choose **None** from the Signing Key list.
- If you choose to sign your PGP Zip Archive, choose your key from the Signing Key list, then enter the passphrase of the key selected for signing (not the passphrase used to secure the zip). To see keystrokes as you type the passphrase, select **Show Keystrokes**.

If you have already typed your passphrase during this session using PGP Desktop, your passphrase might be cached, depending on your **Options** settings. A message is displayed stating that the passphrase is cached, if this is the case. Even if your passphrase is cached, you can still choose not to sign the PGP Zip Archive file.

5 Confirm that the PGP Zip Archive is being saved in the location you want. If necessary, you can:

- Change where the file is saved by clicking **Browse** and choosing a location from the Windows File dialog box.

- Change where the file is saved by manually typing the location where you would like to save the PGP Zip Archive.

The default file name for a sign-only PGP Zip Archive is the name of that item with `.sig` appended.

6 If you would prefer to have a separate signature file, along with your PGP Zip Archive, click to select **Save Detached Signatures**.

7 Click **Next**. The sign-only PGP Zip Archive is created.

8 Click **Finish**.

Opening a PGP Zip Archive

PGP Desktop must be installed on the system to open a PGP Zip archive.

To open a PGP Zip Archive

1 Double click the PGP Zip archive file (it has a `.pgp` file extension).

- If the PGP Zip archive was secured with a key, the PGP Enter Passphrase for Listed Key dialog box is displayed.
- If the PGP Zip archive was secured with a passphrase, the PGP Enter Passphrase dialog box is displayed.

PGP Desktop displays the contents of the PGP Zip archive. (If the PGP Desktop application is not open, it is opened with the PGP Zip item active.)

2 To extract items, do the following:

- To extract a single item, right-click the item and select **Extract** from the shortcut menu.
- To extract multiple items, select the items, right-click one of them, and select **Extract** from the shortcut menu.

The Browse for Folder dialog box is displayed.

3 Locate the folder into which you want to extract the files and click OK. To create a new folder, **New Folder**. The file(s) are extracted into the location you specified.

If you extract the decrypted files from the PGP Zip archive into the same location from which they originally came, the original files are overwritten. To prevent this, for each file, you are prompted to verify if you want to overwrite an existing file.

Opening a PGP Zip SDA

It is not necessary to have PGP Desktop installed to open a PGP Zip SDA.

To open a PGP Zip SDA

1. Double click the PGP Zip SDA file (it should have a `.exe` file extension). The PGP Self-Decrypting Archive - Enter Passphrase dialog box is displayed.
2. Confirm that the output is to be extracted into the desired location. If not, click **Browse** to correct the location, or type it in the field.

   Note: If you direct the decrypted files from the PGP Zip SDA into the same location from which they originally came, the original files are overwritten. To prevent this, for each file, you are prompted to select a different location. You can also type a different file name. If you if you click **Save** without doing this, a warning dialog box displays. If you bypass it, the file from the PGP Zip SDA overwrites the original.
3. Type the passphrase for the PGP Zip SDA, then click **OK**. The PGP Zip SDA is decrypted.

Editing a PGP Zip Archive

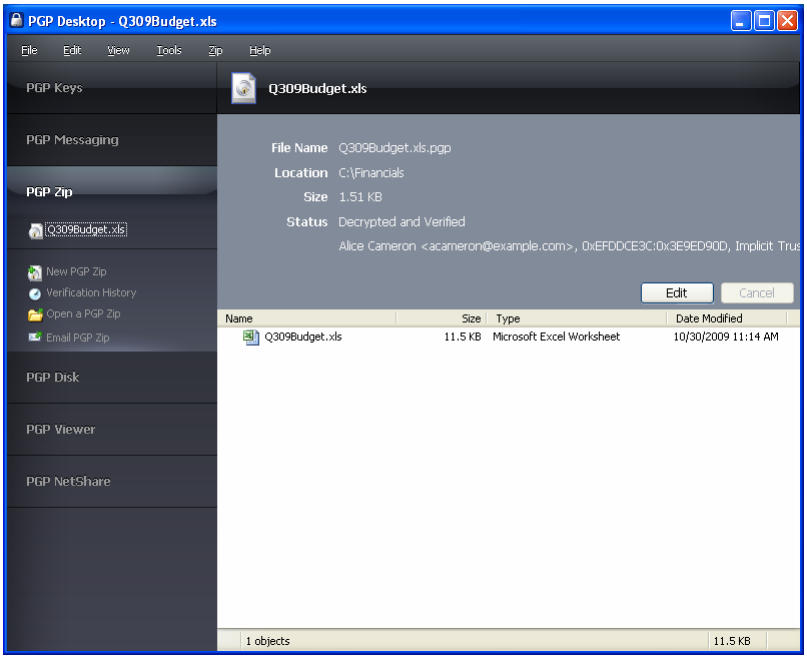
PGP Zip Archives are not static. At any time, you can:

- Extract files from them.
- Add files to them.
- Edit the settings of the archive itself.

To edit a PGP Zip archive

1. In PGP Desktop, click the PGP Zip Control box. The PGP Zip Control box highlights.
2. Click the name of the PGP Zip archive you want to edit in the list of PGP Zip archives at the top of the PGP Zip Control box. The settings for the archive and the files and/or folders in the archive are displayed.

If the PGP Zip archive you want to open is not listed, click **Open a PGP Zip**, navigate to the `.pgp` file, select it, then click **Open**.



3 To edit the settings of the PGP Zip archive, click **Edit**, and make the desired changes:

- **To add a file to a PGP Zip archive**, click **Add Files** in the PGP Zip Control box, select the file or files you want to add, then click **Open**. The files are added to the archive.
- **To add a folder in the archive and put files into that folder**, click **New Folder** in the PGP Zip Control box and type a descriptive name for the new folder (if desired). Select the new folder, click **Add Files** in the PGP Zip Control box, select the file or files you want to add to the folder, then click **Open**. The files are added to the archive in the folder.
- **To extract a file from an archive**, right-click the file you want to extract, select **Extract** from the shortcut menu, specify a location for the file, then click **OK**. A copy of the file is created in the specified location; the original remains in the PGP Zip Archive.
- **To delete a file or folder from an archive**, select the items you want to delete, then press the **Delete** key on your keyboard. You can also select **Edit > Delete**. The specified items are deleted.
- **To save changes to a PGP Zip archive that you have modified**, click **Save** in the upper right corner or **Save PGP Zip** in the PGP Zip Control box. Specify a location and a name. If the name you select already exists at the location, you will be asked if you want to overwrite the existing file. Type the passphrase that protects the archive, then click **OK**.

- **To change the signing key,** select the PGP Zip file you want to change in the PGP Zip Control Box, click **Edit**, and then select a new **Signing Key**. Click **Save** when you have finished.
- **To change the type of encryption** (Key or Conventional), select the PGP Zip file you want to change in the PGP Zip Control Box, click **Edit**, and then select the type of encryption (**Key** or **Conventional**). Click **Save** when you have finished.
- **To add recipients to the PGP Zip archive**, select the PGP Zip file you want to change in the PGP Zip Control Box, click **Edit**, and then click **Add Recipients**. In the Add Recipients dialog box, select the recipients you want to add and click **OK**. Click **Save** when you have finished.
- **To delete recipients from the archive,** select the PGP Zip file you want to change in the PGP Zip Control Box, click **Edit**, select the recipient you want to remove, and click **Delete Recipients**. Click **Save** when you have finished.

4 When you are done, click **Save**. You can either overwrite the PGP Zip archive to which you made the changes or save the modified archive using a different name.

Verifying Signed PGP Zip Archives

If you received a signed PGP Zip Archive, you should verify the signature so that you know who it came from—and that the archive was not tampered with before you got it.

To verify a PGP Zip Archive

1 Click the PGP Zip Control box and then click **Open a PGP Zip**. The Open dialog box is displayed.

2 Navigate to the signed `.pgp` file you want to verify, click to select it, then click **Open.**

If the message was encrypted (in addition to being signed), you are prompted for the passphrase of your private key, or whichever private key it is that corresponds to the public key to which the message was encrypted.

If the private key is not on your keyring, PGP Desktop will tell you it is not possible to decrypt the message. Unfortunately, this also means you cannot verify the archive. Click **Cancel** to end the verification.

3 Type the passphrase of the private key, then click **OK**.

Note: If the passphrase of the private key is cached, then you are not prompted for the passphrase.

The contents of the archive are saved to the same location as the PGP Zip archive, and the Verification History screen shows the information about the archive you are verifying.

4 To clear the list of verified archives, click **Clear Verification History**. All listings on the Verification History screen are removed.

15 Shredding Files with PGP Shredder

If you want to completely destroy sensitive files without leaving fragments of their data behind, use the PGP Shredder utility.

Note: If you are using PGP Desktop in a PGP Universal Server-managed environment, your PGP Universal Server administrator may have disabled certain features. When a feature is disabled, the control item in the left side is not displayed and the menu and other options for that feature are not available. The graphics included in this guide depict the default installation with all features enabled. If your PGP Universal Server administrator has disabled this functionality, this section does not apply to you.

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Using PGP Shredder to Permanently Delete Files and Folders

If you want to destroy sensitive files or folders completely, use the PGP Shredder feature. When you delete files or folders using PGP Shredder, all traces of the item are removed.

The PGP Shredder feature works by overwriting your data with random text. It repeats this multiple times, or *passes*. You can set the number of passes that the PGP Shredder feature makes whenever it deletes a file—do that by opening the Disk panel of the Preferences screen. For more information about setting options and preferences, see *Disk Options/Preferences* (see "Disk Options" on page 294).

The shred session can be lengthy, depending on such factors as the number of passes you specified, the speed of the processor, and how many other applications are running.

Note: When set for three passes, PGP Shredder exceeds the media sanitization requirements specified in the Department of Defense 5220.22-M standard. While more passes are allowed, modern disk hardware does not require more than two passes. Security continues to increase up to approximately 28 passes. The PGP Shredder feature is capable of up to 49 passes, but remember that more passes means more time needed for secure deletion.

There are multiple ways to use PGP Shredder:

- Use the PGP Shredder icon on your desktop (placed there when you installed PGP Desktop).
- Select **Tools > Shred Files**, then browse to the file/folder you want to shred.
- Use the Windows Explorer shortcut menus (right-click the file, select **PGP Desktop > PGP Shred [file name]**).

PGP Shredder does not delete the following items:

- Windows system files or files that are read-only.

  Note that the Thumbs.db file, created when viewing thumbnail graphics in Windows Explorer, is a special case and can be shredded even though the file has the system attribute set.
- WebDav or Sharepoint files.

  Files that can be deleted are local files and CIFS shared files.
- Directories containing files that cannot be deleted.

You can also use PGP Desktop to erase free disk space that could contain data from previously deleted files and programs using the PGP Shred Free Space Assistant.

It is especially important to use the PGP Shred Free Space Assistant on Journaling file systems such as NTFS, as such file systems make a second copy of everything written to disk in a file system journal. This helps the disk recover from damage, but requires extra work when removing sensitive data. Shredding a file does not remove any potential journal entries that may have been created. NTFS in particular can also store small (less than 1K) files in internal data structures that cannot be removed properly without using the PGP Shred Free Space Assistant with the **Shred NTFS internal data structures** option.

Tip: Consider other occurrences of the data that might linger elsewhere on your disk, such as temp files. For this reason, consider using PGP Whole Disk Encryption to protect all data on your system.

Shredding Files using the PGP Shredder Icon on Your Desktop

To shred files using the PGP Shredder icon on your Desktop

1. Drag and drop the files/folders you want to shred onto the PGP Shredder icon. A confirmation dialog box is displayed, asking you to confirm that you want to shred (secure delete) the listed files and/or folders.
2. Click **Yes.** The files are securely deleted from your system.

Shredding Files From Within PGP Desktop

To shred files in PGP Desktop

1. In the PGP Desktop main application window, select **Tools > Shred Files**. The Open dialog box is displayed.
2. Select the files on your system you want to shred, then click **Open.** A confirmation dialog box is displayed, asking you to confirm that you want to shred (secure delete) the listed files and/or folders.
3. Click **Yes.** The files are securely deleted from your system.

Shredding Files in Windows Explorer

To shred files by right-clicking in Windows Explorer

1. In Windows Explorer, right-click files/folders you want to shred. A confirmation dialog box is displayed, asking you to confirm that you want to shred (secure delete) the listed files and/or folders.
2. Click **Yes.** The files are securely deleted from your system.

Using the PGP Shred Free Space Assistant

To shred free space on your disks

1. With PGP Desktop open, select **Tools** > **PGP Shred Free Space**. The Introduction screen of the PGP Shred Free Space Assistant is displayed.
2. Read the information, then click **Next.** The Gathering Information dialog box is displayed.
3. In the **Shred drive** field, select the disk or volume you want to shred and the number of **passes** you want PGP Shred Free Space to perform. While three passes with PGP Shred are sufficient to securely delete the data, you can specify up to 49 passes. The recommended guidelines for number of passes are:
   - 3 passes for personal use.
   - 10 passes for commercial use.
   - 18 passes for military use.
   - 26 passes for maximum security
4. Choose whether to shred internal NTFS data structures. This option is not available on all systems.

   Caution: If the selected partition is *not* your boot partition, you can perform an intensive shred operation that overwrites internal NTFS data structures that may hold residual data. The partition will be completely filled during this process, and as such *you should not use the disk for anything else while the free space shred operation is in progress*. Some of these structures are not generally considered free space on your drive, but the techniques employed by this option will cause them to be shredded. This option does not increase the risk of anything negative happening to your disk as a result of the shredding operation.
5. Click **Next.** The Perform Shred dialog box is displayed, containing statistical information about the drive or volume you selected.
6. Do one of the following:
   - To start shredding free space immediately, click **Begin Shred.** The PGP Shred Free Space Assistant scans and then shreds leftover fragments from the specified disk or volume.

   When the shred session is complete, a message is displayed near the bottom of the Perform Shred screen telling you the selected drive has been shredded.

- To schedule a time for the free space shred operation, click **Schedule**. A message is displayed informing you that the Windows Task Schedule is used when scheduling PGP Shred Free Space operations and that you need a Windows login password for the job to run.

  To schedule the job, click **OK**, enter your Windows login password in the PGP Enter Confirmed Passphrase dialog box, and then enter the scheduling information.

  To cancel the job and return to the Perform Shred dialog box, click **Cancel**.

7 Click **Next.** The Completing dialog box is displayed.

8 Click **Finish.**

Scheduling Free Space Shredding

Use the Windows Task Scheduler to schedule periodic shredding of free space on your system.

To schedule free space shredding

1 Follow the steps in *Using the PGP Shred Free Space Assistant* (on page 266) until the Perform Shred dialog box is displayed.

2 Click **Schedule**.

3 A message is displayed informing you that the Windows Task Schedule is used when scheduling PGP Shred Free Space operations and that you need a Windows login password for the job to run. To continue, click **OK**. The PGP Enter Confirmed Passphrase dialog box dialog box is displayed.

4 Type your Windows login password in the first field, type it again to confirm it in the second field, then click **OK.** The Windows Task Schedule dialog box is displayed.

5 In the **Schedule Task** area, specify how often you want the task to run:

- **Daily.** This option runs your task once at the time you specify on the days you indicate. Click **OK** to close the dialog box, then enter the time you want to run the task each day in the Start Time text box.
- **Weekly.** This option runs your task on a weekly basis at the date and time you specify. Enter the number of weeks you want between each disk shred in the text box provided, then choose a day from the Schedule Task Weekly list.
- **Monthly.** This option runs your task once each month on the day and at the time you specify. Enter the time in the text box provided, then enter the day of the month on which you want the task to run. Click **Select Months** to specify which months the task will run.

- **Once.** This option runs your task exactly once on the date and at the time you specify. Enter the time in the text box provided, then select a month and a date from the lists Run On text box.
- **At System Start up. T**his option runs your task only upon system start up.
- **At Logon.** This option runs your task when you log on to your computer.
- **When Idle.** This option runs your task when your system is idle for the amount of time you specify in the minutes text box.

6 In the **Start Time** field, enter the time of day that you want the task to start.

7 In the Schedule Task Daily field, specify how often you want the task to run.

8 Click **Advanced** to open a dialog box where you can select additional scheduling options, such as the start date, the end date, and the duration of the task.

9 Click **OK.** A confirmation dialog box is displayed.

Your new PGP folder or free space task is now scheduled. To edit or delete your PGP tasks, use the Windows Task Scheduler.

16 Storing Keys on Smart Cards and Tokens

Use PGP Desktop to create a PGP keypair on a smart card or token, or to copy a PGP keypair to a smart card or token. Both options give you an extra layer of security in that you can keep your PGP keypair with you, on your smart card or token, instead of leaving it on your system: a PGP keypair on a smart card or token is less vulnerable than the same keypair stored on your computer because you can keep the smart card or token with you. This section describes how to use smart cards with PGP Desktop.

Note: If you are using PGP Desktop in a PGP Universal Server-managed environment, your PGP Universal Server administrator may have disabled certain features. When a feature is disabled, the control item in the left side is not displayed and the menu and other options for that feature are not available. The graphics included in this guide depict the default installation with all features enabled. If your PGP Universal Server administrator has disabled this functionality, this section does not apply to you.

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About Smart Cards and Tokens

In order to use PGP Desktop with a smart card or token from a particular vendor, you must have a compatible smart card reader (if you are using a smart card) and the appropriate software drivers installed on your system (for both smart cards and tokens). The drivers *must* include the PKCS-11 (the cryptographic token interface standard) library.

PGP Corporation strongly recommends using software drivers from the vendor who makes your smart card or token.

PGP Desktop recognizes and works with a wide variety of smart cards, including those from Athena, AET SafeSign, Axalto (formerly Schlumberger), SafeNet (formerly Rainbow), Aladdin, and GemPlus. PGP Desktop also works with Department of Defense Common Access Cards with the ActivCard Gold 2.0 profile.

In addition to these vendors, PGP Desktop recognizes and works with smart cards from vendors that include a standards-based PKCS-11 library in their software drivers. If the PKCS-11 library from a vendor is installed on your system and works with other PKCS-11 applications, such as Mozilla Firefox or Thunderbird, chances are high that PGP Desktop will recognize and work with smart cards from this vendor.

When you create and store a PGP keypair on a smart card, you access the private key using the PIN for the smart card, rather than a passphrase. If you have a smart card that handles its own authentication (for example, on its own keypad or via a biometric device, PGP Desktop works with these smart cards; when PGP Desktop displays a passphrase dialog, do not enter a passphrase, just click OK. The device should then bring up its own authentication method.

Note: The private portion of your keypair that is generated on a smart card never leaves the device—it's not exportable. Decryption and signing operations take place directly on the device. If you generate a keypair on your computer rather than on the smart card, and then copy the keypair to your smart card while leaving the keypair on your computer, you can still export the private portion of your keypair from your computer.

Department of Defense Common Access Cards

Department of Defense Common Access Cards (CACs) work somewhat differently than other smart cards. They are read-only, and they include two separate certificates: one for signing and one for encrypting. PGP Desktop filters the two certificates based on the intended usage. For example, when you are prompted to select a key to sign a file, only the signing certificate of a CAC is listed.

JavaCards

Axalto smart cards are JavaCards. A small Java module, called a Java applet, runs on the card. The card can be configured to execute different applets that change the behavior or configuration of the smart card, a process called personalization. In order for JavaCards to be used with PGP Desktop, only a few of the available personalization profiles are appropriate.

Additionally, all of the personalization profiles currently available require minor changes to their configurations to work with PGP Desktop. Specifically:

- The profile must enable PKCS-11 support. In most cases, the name "Netscape" or "Entrust" appear in the titles of profiles that support PKCS-11.

- One PGP Desktop key uses at least two PKCS-11 private keys. In order to work with PGP Desktop, a profile must have a value of 2 or greater in the maximum number of private keys allowed.

For more information, see the documentation for the JavaCard you are using.

Compatible Smart Cards

PGP Desktop recognizes and works with the following cards:

- DoD Common Access Cards (CACs) with the **ActivCard** Gold 2.0 profile. For more information about the ActivCard Gold 2.0 profile, go to the *ActivCard website* (www.activcard.com).
- **AET SafeSign** smart cards, including ASEKey 1.0. For more information about smart cards from AET SafeSign, go to the *Cryptoshop website* (www.cryptoshop.com).
- **Aladdin** smart cards, including eToken PRO USB 16K, 32K, and 64K; Aladdin eToken NG-OTP 32K; and eToken PRO Java. For more information about Aladdin eToken products, go to the *Aladdin Support Web Site* (http://www.aladdin.com/support/default.asp).
- **Athena Smart Card Solutions** smart cards, including the ASEKey USB token. For more information about smart cards from Athena Smart Card Solutions, go to the *Athena Smart Card website* (www.athena-scs.com).
- **Axalto** (formerly Schlumberger) smart cards, including the Cryptoflex 32K. For more information about smart cards from Axalto, go to the *Axalto website* (www.axalto.com).
- **Axalto Cyberflex Access 32K V2**. For more information about smart cards from Axalto, go to the *Axalto website* (www.axalto.com).
- **EMC RSA SecurID 800** (Rev A, B, and D). For more information about tokens from EMC, go to the EMC/RSA *website* (http://www.rsa.com/).
- **Gemalto .NET v2** smart cards. For more information about Gemalto smart cards, go to the *Gemalto Web Site* (http://www.gemalto.com).
- **GemPlus** smart cards, including SafesITe and GemXpresso Pro, using GemSafe Libraries 4.2.0-015 (Gold). For more information about smart cards from GemPlus, go to the *GemPlus website* (www.gemplus.com).
- **Giesecke and Devrient** Sm@rtCafe Expert 3.2 personal identity verification cards using ActivClient version 6.1 client software. For more information about PIV cards from G&D, go to the *Giesecke and Devrient Web site* (http://www.gi-de.com/).
- **Oberthur** ID-One Cosmo V5.2D personal identity verification cards using ActivClient version 6.1 client software. For more information about PIV cards from Oberthur, go to the *Oberthur website* (http://www.oberthurcs.com/index.aspx).

- **SafeNet** smart cards, including iKey 2032. (PGP Desktop is not compatible with the SafeNet iKey 1000 or 4000.) For more information about smart cards and USB tokens from SafeNet, go to the *SafeNet website* (www.safenet-inc.com/products/tokens/index.asp).
- **T-Systems** Telesec NetKey 3.0 and TCOS 3.0 IEI cards. For more information on the T-Telesec NetKey smart cards, go to the *T-Systems website* (www.t-systems.com).

PGP Desktop also recognizes and works with smart cards from other vendors, if the vendor includes a standards-based PKCS-11 library in their software drivers. In the case where a non-standard smart card does not work with PGP Desktop, **Smart Card Keys** is not displayed in the PGP Keys Control box when the smart card is installed on the system.

Recognizing Smart Cards

Before you can examine the properties of a smart card you want to use with PGP Desktop, or create a PGP keypair on a smart card, you need to make sure that PGP Desktop recognizes that the smart card you want to work with is available on the system.

The general requirements for this are:

- The smart card software drivers, with PKCS-11 support, must be installed on the system.
- The smart card must be installed on the system. For a USB token, this generally means it is inserted into a USB port. For a smart card, it generally means it is inserted into the appropriate smart card reader.

Once you have installed the drivers and smart card, verify that PGP Desktop recognizes the system. There are two ways to do this:

- The easiest way to tell if PGP Desktop "sees" a smart card is to open PGP Desktop and click on the PGP Keys Control box. If "Smart card Keys" is listed below "All Keys" in the PGP Keys Control box, then PGP Desktop sees the smart card on the system.
- A slightly more complicated way is to open PGP Desktop, click the PGP Keys Control box, and then from the **File** menu, select **New PGP Key**. When the PGP Key Generation Assistant screen is displayed, look towards the bottom. If the **Generate Key on Token: <smart card information>** check box is active, then PGP Desktop sees the smart card on the system. This method has a slight advantage over the previous method in that PGP Desktop shows you information about the particular smart card that it sees on the system.

Examining Smart Card Properties

A PGP key stored on a smart card is noted on the PGP Desktop screen with a special key-on-a-card icon. By viewing its properties, you can find information regarding the smart card itself, such as the manufacturer, serial number, and key types it supports.

To view the properties of a smart card

1. Insert your smart card in your smart card reader or insert the token in a USB port. The key is displayed in the Smart Card Keys section of the PGP Keys Control box.
2. Open PGP Desktop.
3. Highlight the key for the properties you want to view.

   Select **Keys > Smart Card Properties**. The PGP Smart Card Properties dialog box is displayed, providing information about the smart card on which the key resides:

   - Name of the manufacturer.
   - Smart card model.
   - Serial number associated with the smart card.
   - Capabilities of the mart card, including the type of PGP key that the card can store and the number of characters your PIN may contain.
   - Total number of private keys you currently have on the smart card, including subkeys.
4. Click **OK.**

Generating a PGP Keypair on a Smart Card

To generate a PGP keypair on a smart card

1. Insert your smart card in your smart card reader or insert the token in a USB port. The key is displayed in the Smart Card Keys section of the PGP Keys Control box.
2. Open PGP Desktop.
3. Click the PGP Keys Control box. If the smart card is detected, "Smart Card Keys" is displayed in the PGP Keys Control box.
4. Select **File > New PGP Key**. The PGP Key Generation Assistant Introduction dialog box is displayed.

PGP Desktop recognizes the software drivers from one smart card vendor at a time. If you have the software drivers from more than one smart card vendor installed on your system, you need to specify which vendor's smart cards you want to use with PGP Desktop. For more information, see *Using Multiple Smart Cards* (on page 277).

5 Select the checkbox labeled **Generate Key on Token: [name of smart card on system]**, then click **Next**. The Name and Email Assignment dialog box is displayed.

6 Type your name in the **Full Name** field and your email address in the **Primary Email** field. If you want to enter more email addresses for this key, click **More** and type the email address(es) in the **Other Addresses** fields.

Tip: It is not absolutely necessary to enter your real name or email address. Using your real name and email address makes it easier for others to identify you as the owner of your public key.

7 To specify advanced key settings, click **Advanced**. The Advanced Key Settings dialog box is displayed. Specify the settings for:

- **Key type**: RSA (Diffie-Hellman/DSS keys are not supported)
- **Key size**: From 1028 to 2048
- **Expiration**: Never or a date you specify
- **Allowed algorithms**: AES, CAST, TripleDes, IDEA, and Twofish
- **Preferred algorithm**: Choose one of the allowed algorithms
- **Allowed hash**: SHA-2-256, SHA-2-384, SHA-2-512, RIPEMD-160, SHA-1, MD-5
- **Preferred hash**: Choose one of the allowed hashes

Some settings may not be available if the smart card you are using does not support them.

Click **OK** to save your settings and exit the Advanced Key Settings dialog box.

8 Click **Next**.

9 On the Passphrase Assignment dialog box, enter the PIN that corresponds to the smart card. The PIN acts as passphrase for the key. Normally, as an added level of security, the characters you enter for the passphrase do not appear on the screen. However, if you are sure that no one is watching, and you would like to see the characters of your passphrase as you type, select the **Show Keystrokes** checkbox.

10 Click **Next** to begin the key generation process. PGP Desktop generates your new keypair directly on your smart card. This process can take several minutes.

11 When the key generation process indicates that it is done, click **Next**. You are prompted to add the public key portion of the key you just created to the PGP Global Directory.

12 Read the text on the screen and do one of the following:

- To post your public key to the PGP Global Directory, click **Next**.
- To prevent your public key from being posted to the PGP Global Directory, click **Skip**.

13 Click **Done**. Your new keypair is generated and stored directly on your smart card.

Because the private portion of your keypair resides only on your smart card, when you remove the smart card from the system, the key icon changes to a single key to reflect that the public portion is left on the keyring and the private portion has been removed with the smart card.

Copying your Public Key from a Smart Card to a Keyring

Storing your keys on a smart card enables you to physically walk to a computer—a computer with a compatible smart card reader or a free USB port, and PGP Desktop and the appropriate drivers installed—and automatically copy the *public* portion of your keypair to the PGP Desktop keyring on that system.

▸ **To copy your public key from your smart card to another user's keyring:**

1 Insert your smart card in your smart card reader or insert the token in a USB port. The key is displayed in the Smart Card Keys section of the PGP Keys Control box.

2 Open PGP Desktop.

3 Wait for your key to display in PGP Desktop. When you see your key display, it indicates that your public key has been copied onto the system.

4 Remove your smart card from the system. Your public key remains on the system.

Copying a Keypair from Your Keyring to a Smart Card

Use PGP Desktop to copy an existing keypair from your system to a smart card. This is a good way to make a backup of your keypair and/or to distribute your public key. Only RSA keys can be copied to a smart card.

Note: You cannot copy Diffie-Hellman/DSS keys to a smart card.

Copying your keypair to a smart card is different from creating a keypair directly on the smart card (which is not available for all smart cards). When you create a keypair directly on a smart card, you *must* have the smart card on the system to use your private key.

When you have an existing keypair that you copy to a smart card, the private portion of your keypair resides on the smart card *and on your system* (unless you choose to delete the private portion of your keypair from your system).

There are two main reasons to copy an existing keypair to a smart card:

- To use it as a back up for the keypair on your system and to copy your public key from the smart card to other people's keyrings. In this case, you would have two copies of the same private key: one on the system where you originally created it and one on the smart card.
- To use it as your only copy of your private key, just as if you had created it directly onto the smart card. In this case, you need to delete the private key from your system (PGP Desktop gives you the option to do this). Select the option to delete the private key from your system if you started using smart cards after you had already created your PGP keypair but wanted to have the advantages of having your keypair on your smart card without creating a new keypair.

Finally, when you copy your PGP keypair to a smart card, the passphrase for the keypair that is on the smart card is automatically changed from whatever it was to the PIN of the smart card. However, the passphrase for the keypair that was already on your system, the keypair you copied to the smart card, *does not change*. You have two copies of the same keypair, each with its own passphrase.

If you decide to delete the private key from your system and just keep the private key on your smart card, simply use the PIN of the smart card as the passphrase for your private key.

To copy an existing PGP keypair to your smart card

1. Insert your smart card in your smart card reader or insert the token in a USB port. The key is displayed in the Smart Card Keys section of the PGP Keys Control box.
2. Open PGP Desktop.
3. Right-click the keypair you want to copy and select **Add To > Smart Card Keys**. A warning dialog box is displayed informing you that once the keypair is copied to the smart card, your PGP passphrase for this keypair automatically changes to the PIN of the smart card.
4. Click **OK** to continue. The PGP Enter Passphrase dialog box is displayed.
5. Type the passphrase for your key, then click **OK**. The PGP Enter Passphrase dialog box is displayed.
6. Type the PIN for the smart card, then click **OK**. The keypair is copied to the smart card. PGP Desktop asks if you want to remove the private portion of the keypair from your keyring so that it only resides on the smart card.

7 Do one of the following:

- To remove the private portion of your keypair from your keyring, click **Yes**. The private portion of your keypair is deleted from the keyring on your system and exists only on your smart card.
- To leave the private portion of your keypair on your keyring, click **No**. The private portion is not deleted; you now have two copies of the same keypair, one on your system and the other on your smart card.

Wiping Keys from Your Smart Card

You can delete all the data stored on a smart card by using the **Wipe Contents** feature in the Smart Card properties dialog box.

To wipe a smart card

1 Insert your smart card in your smart card reader or insert the token in a USB port. The key is displayed in the Smart Card Keys section of the PGP Keys Control box.

2 Open PGP Desktop.

3 In the PGP Keys box, select **Smart Card Keys**. The PGP keys on the smart card appear.

4 Select the smart cards or tokens you want to wipe.

5 Select **Keys > Wipe Smart Card**. PGP Desktop asks for confirmation you want to delete all keys currently on the smart card or token.

6 Click **OK**. The PGP Enter Passphrase dialog box is displayed.

7 Type the PIN for this smart card. Normally, as an added level of security, the characters you enter for the passphrase do not appear on the screen. However, if you are sure that no one is watching, and you would like to see the characters of your passphrase as you type, select the **Show Keystrokes** checkbox.

8 Click **OK**. PGP Desktop deletes all keys stored on the smart card.

Using Multiple Smart Cards

PGP Desktop is compatible with smart cards from a wide variety of vendors. At the same time, PGP Desktop only works with the smart cards from one vendor at a time.

On startup, PGP Desktop automatically searches your system for software drivers that support the use of smart cards from a particular vendor. When it finds those software drivers, it loads them, assuming you have smart cards from that vendor and want to use them.

If you have the software drivers from a single vendor installed on your system, this works perfectly; PGP Desktop automatically finds the software drivers and lets you use the smart cards from that vendor. You don't have to do anything; it just works.

However, there may be some occasions when you need to use the smart cards from more than one vendor. When this happens, and you have the software drivers from more than one vendor on a system, you need to tell PGP Desktop whose smart cards you want to use. Otherwise, PGP Desktop won't know which software drivers to use, and may not select the ones you want.

To specify which smart card software drivers to use

1. Open PGP Desktop.
2. Select **Tools > PGP Options**. The PGP Options dialog box is displayed.
3. Click the Keys tab.
4. In the **Synchronization** section, from the **Synchronize with smart cards and tokens** list, select the vendor for the software drivers you want to use:
   - When you have the software drivers from only one vendor on your system, use the default setting, **Automatically**.
   - To prevent PGP Desktop from using the smart cards from any vendor, Select **None** .
   - To specify a vendor *not* on in the list, select **Other.** On the Select Smart Card Driver dialog box, navigate to the DLL file of the software drivers of your smart card vendor, select it, then click **Open.** You can now use smart cards supported by the software driver file you selected.

PGP Desktop now expects you to use smart cards from the selected vendor. If you add a smart card from a different vendor to your system, PGP Desktop will not recognize it. You must follow this procedure to change to a different smart card vendor.

Special-Use Tokens

PGP Desktop uses the Aladdin eToken Pro USB token for authentication at startup if the system's *boot* drive has been whole disk encrypted (for more information on protecting a boot drive with PGP Whole Disk Encryption, see *Protecting Disks with PGP Whole Disk Encryption* (on page 135)). Only the Aladdin eToken Pro USB token can be used for this purpose. For information on how to configure this token, see *Configuring the Aladdin eToken* (on page 279)

Configuring the Aladdin eToken

You need an Aladdin eToken Pro USB token with a PGP keypair on it to use with the PGP Whole Disk Encryption feature of PGP Desktop for Windows.

To create an Aladdin eToken Pro USB token to use with PGP Whole Disk Encryption

1. Obtain an Aladdin eToken Pro USB token. This is the only token that can be used with PGP Whole Disk Encryption. Use any of the three models: 16K, 32K, or 64K. The 16K and 32K models support 1024-bit keys; the 64K mode supports up to 2048-bit keys.
2. Make sure the appropriate driver software from Aladdin is installed on your system. For more information on the Aladdin drivers, see *Required Drivers for the Aladdin eToken* (on page 152).

   When the driver software is installed, PGP Desktop displays **Smart Card Keys** in the PGP Keys Control box.
3. Open PGP Desktop for Windows.
4. Create a keypair on the Aladdin eToken (for instructions, see *Generating a PGP Keypair on a Smart Card* (on page 273)) or use the **Add To** shortcut menu to copy an existing keypair to the token (for instructions, see *Copying a Keypair from Your Keyring to a Smart Card* (on page 275)).

   If you want to send an existing keypair to the token, it must be a 1024- or 2048-bit RSA key. The Aladdin eToken Pro token does not support any other key sizes or DH/DSS keys at this time.

   When you create a keypair on the token, or send an existing keypair to the token, the passphrase of the keypair changes to the PIN of the token. The default PIN for the Aladdin eToken Pro token is 1234567890. This is a well-known PIN, so be sure to change it using the Aladdin software.
5. You can now use the PGP keypair on the Aladdin eToken with PGP Whole Disk Encryption.

A Setting PGP Desktop Options

PGP Desktop is configured to accommodate the needs of most users, but you have the option of adjusting settings to suit your requirements. This section describes the options you can set in PGP Desktop.

Note: If you are using PGP Desktop in a PGP Universal Server-managed environment, your PGP Universal Server administrator may have disabled certain features. When a feature is disabled, the control item in the left side is not displayed and the menu and other options for that feature are not available. The graphics included in this guide depict the default installation with all features enabled. If your PGP Universal Server administrator has disabled this functionality, this section does not apply to you.

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Master Keys Options 287
Messaging Options 287
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Accessing the PGP Options dialog box

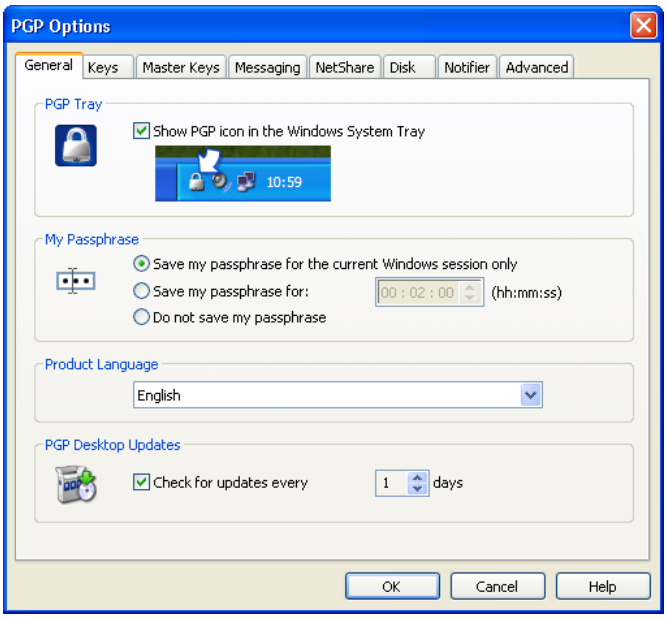
To access the PGP Options

1. Do one of the following:
   - Click the **PGP Tray** icon in the Windows System Tray, then select **Options**.
   - Open PGP Desktop, then select **Tools > PGP Options**.
2. Select a tab and make the changes you want. When you are finished with a particular tab, select another tab.

3 To save your changes and exit, click **OK**. To cancel any changes you have made, click **Cancel**.

General Options

The General tab contains a variety of PGP Desktop settings.



The options on the General tab of the Preferences dialog box are:

- **Show PGP icon in the Windows Tray**. When enabled, the PGP icon is displayed in the Windows Tray while PGP Desktop is active on the system. The PGP Tray icon provides easy access to PGP Desktop functions. Deselect the checkbox to remove the PGP icon from the Windows Tray. To restore the PGP icon, start PGP Desktop, then from the **Tools** menu select **PGP Options.** Access the General tab, and select the checkbox.

  Note: If you are using PGP Desktop in a PGP Universal Server-managed environment, this option may be required.

  Removing the PGP Tray icon from the Windows System Tray does not shut down PGP Desktop services. PGP Desktop services continue running when the PGP Tray icon is removed from the Windows System Tray.

  To stop PGP Services, click the PGP Tray icon. Select **Stop PGP Services** from the list of commands displayed. A warning dialog box is displayed; you must confirm that this is what you intend to do.

  Note: PGP Corporation suggests that you not stop PGP Desktop services unless required to do so.

- **My Passphrase**. Provides options to save your passphrase.
  - **Save my passphrase for the current Windows session**. Automatically saves your passphrase in memory until you log off your computer. This is called *caching* your passphrase. If you enable this option, you are prompted for your passphrase once per private key. You are not prompted to type it again for the same key until you log off your computer.

Caution: When this option is enabled, it is very important that you log off your computer before leaving it unattended. Your passphrase can remain cached for weeks if you never log off, allowing anyone to read your encrypted messages, or encrypt messages with your key, while you are away from your computer. If you normally remain logged on to your computer for long periods of time, consider choosing one of the other passphrase caching options.

  - **Save my passphrase for X (hh:mm:ss)**. Automatically saves your passphrase in memory for the specified duration of time. If you enable this option, you are prompted for your passphrase once for the initial signing or decrypting task. You are not prompted to type it again until the specified time has elapsed. The default setting is 00:02:00 (2 minutes).
  - **Do not save my passphrase**. Prevents your passphrase from being stored in memory. If you enable this option, you must type your passphrase each time it is needed.

    Note that, even if you choose not to save your passphrase, you will only be prompted to enter your passphrase once to access all the files within a folder that has been added to PGP NetShare.

- **Product Language**. Use this option to select the language in which the PGP Desktop user interface is presented. The options are: English (the default), German, French,Japanese, and Spanish.

Note: You must log off and log back in to your system if you change to a different language.

- **Check for updates every X days.** When enabled, PGP Desktop checks for software updates automatically at the specified interval. The default is one day. If a newer version of PGP Desktop is available for download, a notification screen is displayed that lets you download the new version. When disabled, PGP Desktop does not automatically check for software updates.

  This option requires an active Internet connection.

  Once you have downloaded the update, install the update by following the prompts.

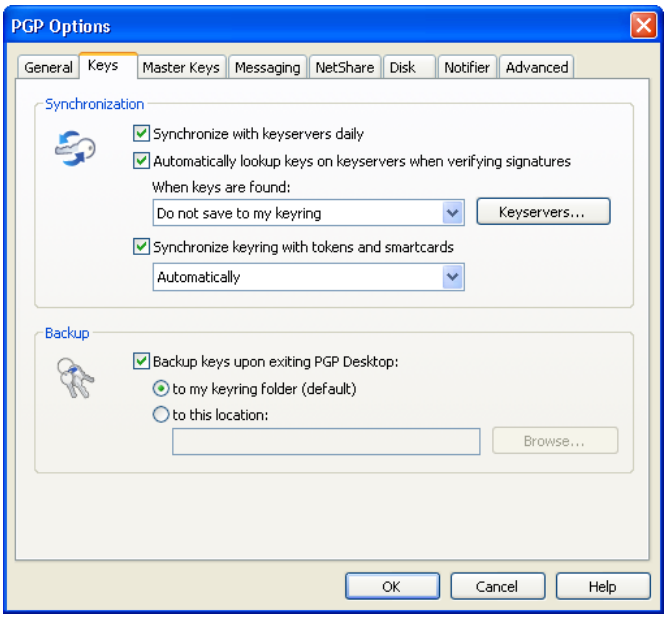
Note: If you are using PGP Desktop in a PGP Universal Server-managed environment, this option may be required. PGP Desktop then searches for updates on its associated PGP Universal Server.

Note: You must have administrative rights on your system in order to install the update.

Note: If you are using PGP Desktop in a PGP Universal Server-managed environment, this option may be required. PGP Desktop then searches for updates on its associated PGP Universal Server.

Keys Options

The Keys tab contains settings that apply to PGP Desktop keys.



The options on the Keys tab are:

- **Synchronization**. These settings specify how you want keys on your keyrings synchronized with public servers.
  - **Synchronize with keyservers daily**. When selected, PGP Desktop performs a daily synchronization of the public keys on your Keyring with your list of keyservers. This list includes the PGP Global Directory.

Note: If you are using PGP Desktop in a PGP Universal Server-managed environment, this option may be required.

If changed versions of the keys are available, they are downloaded automatically. If the keyserver notifies PGP Desktop that a key is removed from the keyserver, PGP Desktop disables that key on the local keyring.

If you use PGP Desktop to make a change to a keypair on your Keyring, that change is not automatically uploaded from your computer to any keyserver. You must manually upload the changed key to the desired keyserver. PGP Desktop prompts you to upload changed keys when you quit PGP Desktop. Otherwise, to send the key to the keyserver, right-click the changed key, select **Send To** from the shortcut menu displayed, and then select the desired keyserver from the list.

- **Automatically lookup keys when verifying signatures**. When this option is enabled, you can specify that PGP Desktop should search the configured keyservers for a verified key if the public keys are not available in your local keyring.

Note: If you are using PGP Desktop in a PGP Universal Server-managed environment, this option is not used. Your PGP Universal Server defines whether keys are looked up and, if found, if they are cached. Keys found in a PGP Universal Server-managed environment are never saved to your keyring.

If the public key is found, there are three options:

- **Do not save to my keyring**. Any key(s) found on the configured keyservers are used only once, to verify the signature with which you are currently working. The key is then not saved to your keyring.
- **Ask to save to my keyring**. Specifies that PGP Desktop should ask if you want to save found keys to your local keyring.
- **Save keys to my keyring.** Specifies that found keys are automatically saved to your local keyring.

- **Synchronize keyring with tokens and smart cards**. Lets you specify how PGP Desktop synchronizes with smart cards and tokens:
  - **Automatically**. PGP Desktop automatically loads and uses the PKCS-11 driver from the first smart card/token vendor it finds on your system. If you have the PKCS-11 driver from just one smart card/token vendor installed on your system, choose this setting; PGP Desktop will automatically recognize and use smart cards/tokens from that vendor.
  - **Listed vendor**. PGP Desktop loads and uses the PKCS-11 driver from the smart card/token vendor you select from the list. If you have the PKCS-11 drivers of more than one smart card/token vendor on your system, use this setting to tell PGP Desktop which vendor's smart cards/tokens you want to use.
  - **Other**. Lets you select a PKCS-11 driver using the **Select Smart Card Driver** dialog box that is displayed. When selected, PGP Desktop recognizes and uses the smart cards/tokens from the vendor whose PKCS-11 driver you select. Use this setting if you want to use the smart cards/tokens from a vendor not listed.

If the PKCS-11 library from a smart card vendor is installed on your system and works with other PKCS-11 applications, such as Mozilla Firefox or Thunderbird, chances are high that PGP Desktop will recognize and work with smart cards from this vendor.

In those rare cases where a non-standard smart card does not work with PGP Desktop, "Smart Card Keys" does *not* appear in the PGP Keys Control box when the smart card is installed on the system.

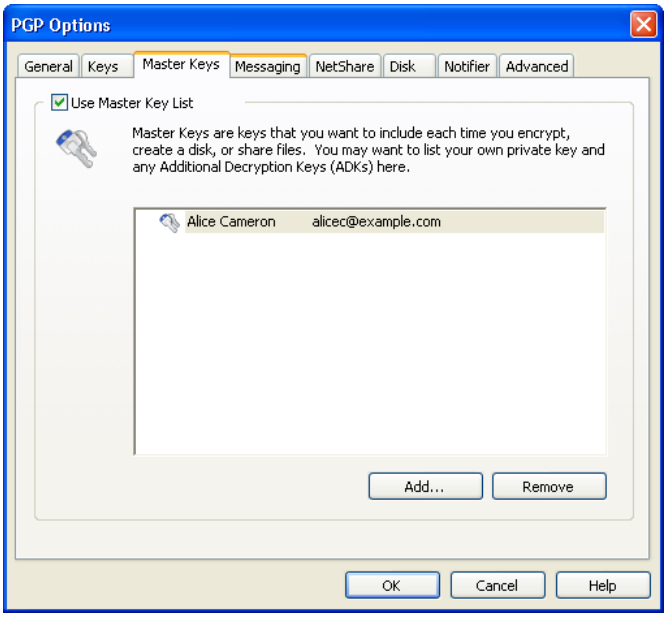
- **None**. PGP Desktop will not recognize or use any smart card or token on your system.

- **Keyservers**. Click to display the PGP Keyservers List dialog box. Use this dialog box to add, edit, or remove the list of keyservers you want to use when automatically looking up keys.

- **Backup**. These settings specify when and where you want your keys backed up.
  - **Backup keys when exiting PGP.** When enabled, PGP Desktop automatically backs up your keys to the location you specify:
    - **To my keyring folder (default).** When selected, your keys are backed up to the default keyring folder on your system. The default location is the My Documents folder.
    - **To this location.** When selected, your keys are backed up to the location on your computer that you specify. Type the full path or click **Browse** to navigate to a location.

Master Keys Options

The Master Key List is a set of keys that you want added by default any time you are selecting keys for messaging, disk encryption, PGP NetShare, and PGP Zip. This saves you the step of dragging the keys that you regularly use into the **Recipients** field.



To use the Master Key List, select the **Use Master Key List** checkbox. You cannot add or remove keys from the Master Key List unless this box is selected.

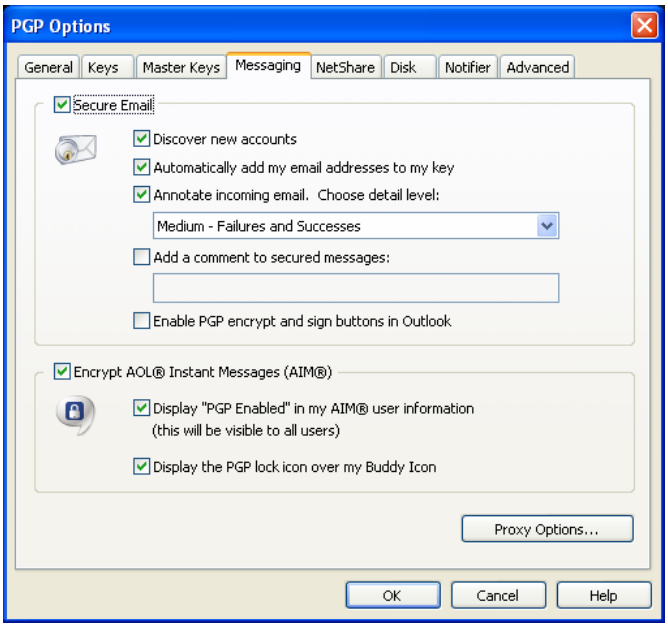
For information on how to add master keys, see *Adding Keys to the Master Key List* (on page 54). For information on deleting master keys, see *Deleting Keys from the Master Key List* (on page 54).

Note: If you generated your key using the Setup Assistant, your key is automatically added to the Master Key list. If you skipped key generation and imported your key into PGP Desktop, your key is not automatically added to the list.

Messaging Options

The Messaging tab contains settings that apply to email and IM messaging.

Note: If you are using PGP Desktop in a PGP Universal Server-managed environment, your PGP Universal Server administrator may have disabled certain features. When a feature is disabled, the control item in the left side is not displayed and the menu and other options for that feature are not available. The graphics included in this guide depict the default installation with all features enabled. If your PGP Universal Server administrator has disabled this functionality, this section does not apply to you.



The options on the Messaging tab are:

- **Secure Email.** Select the **Secure Email** checkbox if you want PGP Desktop to secure all your email accounts automatically. When enabled, PGP Desktop intercepts both incoming and outgoing email messages and secures them based on the appropriate policies.

  Deselect the **Secure Email** checkbox to stop PGP Desktop from securing your email accounts.

  If you select the **Secure Email** checkbox, you can choose these additional options:

  - **Discover new accounts.** Select this checkbox if you want PGP Desktop to monitor your email activity and automatically discover new email accounts that you are using. When a new account is discovered, PGP Desktop asks if you want to secure messages sent using that account.

Note: If you are using PGP Desktop in a PGP Universal managed environment, the use of a wildcard (*) binding causes this function to be no longer active, as all mail services will match the binding of *. Therefore all new accounts will automatically match policy and be created even if this option is deselected.

- **Automatically add my email addresses to my key.** If you select this checkbox, PGP Desktop automatically adds to your key the email addresses that you use to send messages. This option is enabled by default. If you are using PGP Desktop in a PGP Universal Server-managed environment, this option may be disabled.

  Deselect this checkbox to prevent email addresses from being automatically added to your key. This has privacy value; for example, if you want to prevent someone from finding your email address.

- **Annotate incoming email.** Select this checkbox if you want incoming email messages to be annotated with explanatory text detailing the actions that PGP Desktop took when processing your incoming messages. You can choose three annotation levels:

  - **Maximum: Verbose Annotation.** Adds annotations to your incoming email detailing every action that PGP Desktop has taken during message processing.
  - **Medium: Failures and Successes**. This option is the default. Provides annotations when there has been a processing failure, such as unknown key, or unknown signer. The Medium setting adds annotation when incoming email has been successfully decrypted and/or signed.
  - **Minimum: Failures Only.** Only provides annotations when there has been a processing failure.

- **Add a comment to secured messages.** When enabled, the text you type here is always included in messages you encrypt or sign. Comments typed in this field appear below the `--BEGIN PGP MESSAGE BLOCK--` text header and PGP Desktop version number of each secured message. These comments are not visible in decrypted email.

- **Enable PGP encrypt and sign buttons in Outlook**. Select this checkbox if you want to use PGP Desktop encrypt and sign buttons in Microsoft Outlook. This option is not selected by default. For more information on the encrypt and sign buttons, see *Using the Sign and Encrypt Buttons in Microsoft Outlook* (on page 89).

Note: If you are using PGP Desktop in a PGP Universal Server-managed environment, there may already be text in this field.

- **Encrypt AOL® Instant Messages (AIM®).** Enable if you want PGP Desktop to encrypt instant message sessions with compatible instant messaging software.

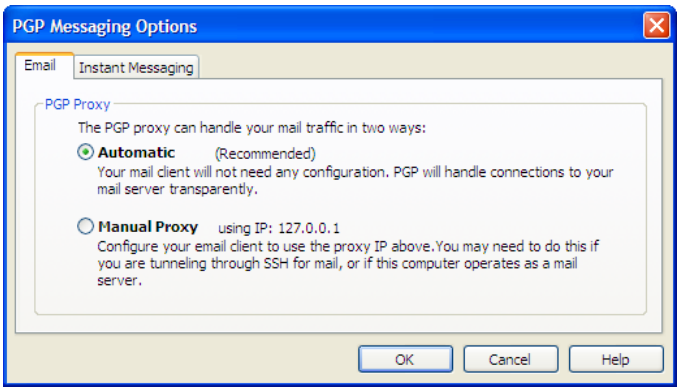
  AOL® Instant Messenger™ and compatible software applications are compatible.

- **Display "PGP Enabled" in my AIM user information**. When selected, **PGP Enabled** is added to your screen name in such places as the AIM Buddy List and the Get Buddy Info command. When disabled, your screen name is displayed without **PGP Enabled.** The appearance of this text may vary depending on your instant messaging client.
- **Display the PGP lock icon over my buddy icon**. When selected, the PGP stylized lock icon is displayed with your buddy icon, so others can see that the IM session is protected. When disabled, your icon is displayed normally.

Proxy Options

Click the **Proxy Options** button to access advanced messaging options.

Email tab


PGP Messaging Options
Email
Instant Messaging
PGP Proxy
The PGP proxy can handle your mail traffic in two ways:
Automatic (Recommended)
Your mail client will not need any configuration. PGP will handle connections to your mail server transparently.
Manual Proxy using IP: 127.0.0.1
Configure your email client to use the proxy IP above.You may need to do this if you are tunneling through SSH for mail, or if this computer operates as a mail server.
OK
Cancel
Help

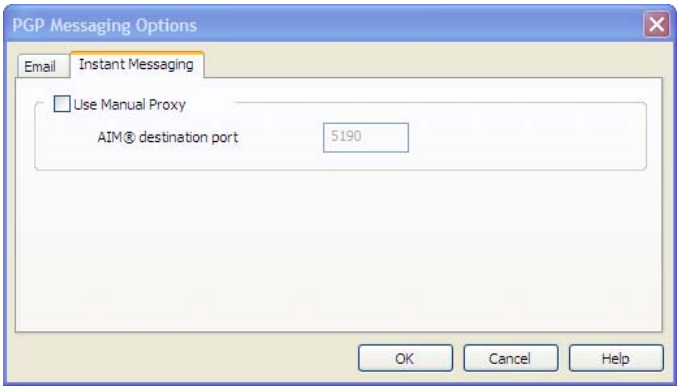
If your computer needs to have a proxy manually configured so that you can send and receive email, you would use this tab.

PGP Desktop "resides" between your email application and the mail server that provides your mail. This configuration enables PGP Desktop to filter, or *proxy,* your email traffic for you automatically. PGP Desktop can protect your messages, based on the applicable policy, without interrupting your work.

Normally, you do not need to change the PGP Proxy settings. However, some users must specify proxy settings manually. Choose the setting that your network administrator recommends:

- **Automatic.** The default, recommended setting. Your email is protected automatically and transparently. PGP Corporation recommends that you leave this option selected unless you are instructed to use the manual proxy setting.
- **Manual Proxy.** This option is needed if your computer is "tunneling" through SSH to your mail server, or if the computer on which you are running PGP Desktop also functions as a mail server. For more information, see *Configuring Manual Mode* (on page 291).

Instant Messaging tab



If your computer is behind a network firewall, you may need to change the network port that AIM uses for your IM chat sessions. Most users do not need to change this setting.

- **Use Manual Proxy.** Select this checkbox to change the port that AIM uses for your IM sessions. Change the value to one other than the default (5190). Your network administrator can tell you if you need to change this setting, and if so, what the correct port number is.

Configuring Manual Mode

If you specify **Manual** for the email proxy, you must also configure the PGP Messaging settings, as well as some settings within your email client (ask your system administrator for the values that you should use):

1. In the PGP Messaging Control box, select the service for which you want to use Manual mode. The New Service panel is displayed.
2. Click **Server Settings**. The Server Settings dialog box for the specified service is displayed.
3. Select the type of server that the new service will be using:
   - **Internet Mail**—for standalone PGP Desktop users who have a POP or IMAP mail connections.
   - **PGP Universal**—for PGP Desktop users who are in a PGP Universal Server-managed environment. Contact your PGP Universal Server administrator for more details on correct settings.
   - **MAPI/Exchange**—for PGP Desktop users who are using Microsoft Outlook as a client on a Microsoft Exchange/MAPI server. For more information on correct settings, contact your mail administrator.
   - **Lotus Notes**—for PGP Desktop users who are using Lotus Notes as their email client with a Lotus Domino server. For more information on correct settings, contact your mail administrator.

4 In the **Incoming Mail Server** section, type a value in the **Redirect local port X to this server** field.

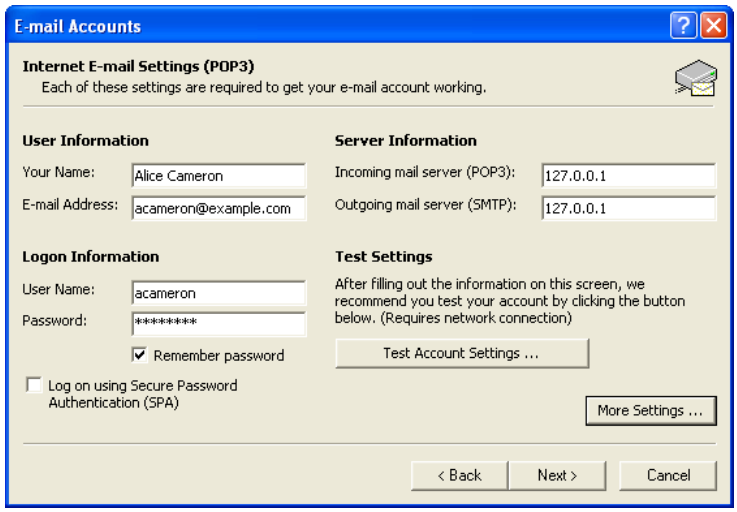
PGP Desktop will monitor this port for email messages going from your mail server to your mail client.

5 In the **Outgoing Mail Server (SMTP)** section, type a value in the **Redirect local port X to this server** field.

PGP Desktop will monitor this port for email messages going from your mail client to your mail server.

6 Click **OK**. The Server Settings dialog box closes.

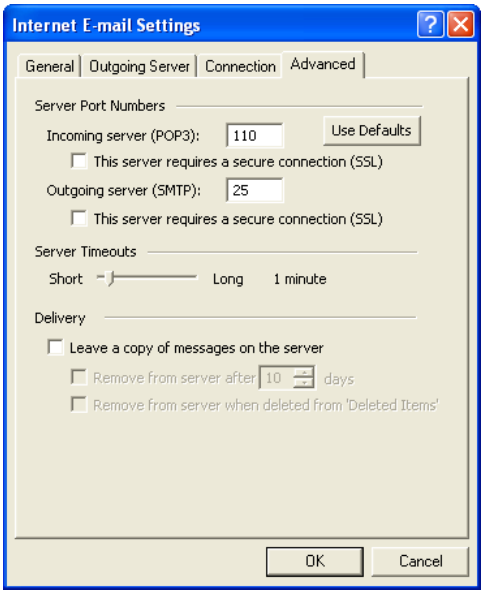
7 Open your email client and navigate to the settings for your email account (if you have multiple accounts, you will need to configure each account separately).



8 For both the **Incoming mail server (POP3 or IMAP)** and **Outgoing mail server (SMTP)** settings in Microsoft Outlook, enter **127.0.0.1**.

9 Click **More Settings**.

10 On the Internet E-mail Settings dialog, click **Advanced**. The **Advanced** tab of the Internet E-mail Settings dialog box is displayed.



11 In the **Incoming server** (POP3 or IMAP) box, type the same value you established for the *incoming* mail server in the Redirect local port X to this server field; Step 7 of this procedure.

12 In the **Outgoing server (SMTP)** box, type the same value you established for the *outgoing* mail server in the Redirect local port X to this server field; Step 8 of this procedure.

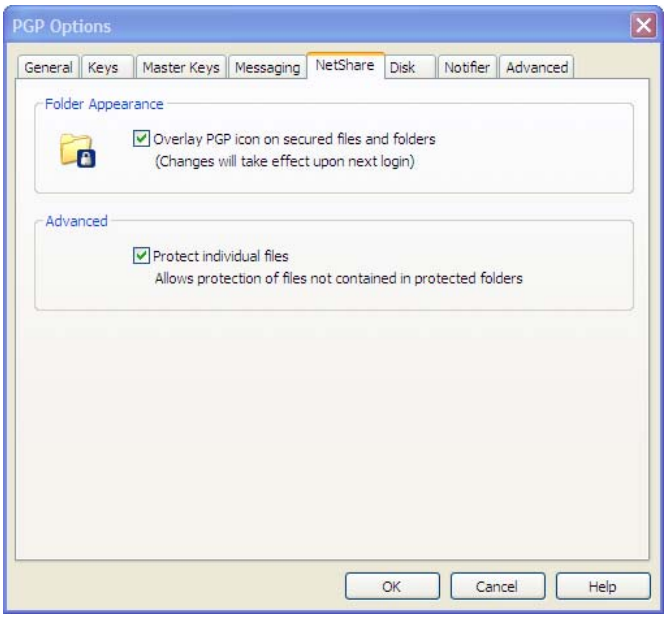
13 Click **OK**, then finish configuring the account settings. Manual mode is configured for the selected service.

14 When you are done configuring Manual mode for the services, restart your computer.

PGP NetShare Options

Use the NetShare options tab to change settings when you protect shared network files.

Note: If you are using PGP Desktop in a PGP Universal Server-managed environment, your PGP Universal Server administrator may have disabled certain features. When a feature is disabled, the control item in the left side is not displayed and the menu and other options for that feature are not available. The graphics included in this guide depict the default installation with all features enabled. If your PGP Universal Server administrator has disabled this functionality, this section does not apply to you.



- **Folder Appearance.** Select **Overlay PGP icon on secured files and folders** if you want a small PGP lock icon to appear on files and folders that are protected using PGP NetShare.
- **Advanced.** Select **Protect individual files** to protect individual files that are outside of a Protected Folder using PGP NetShare.

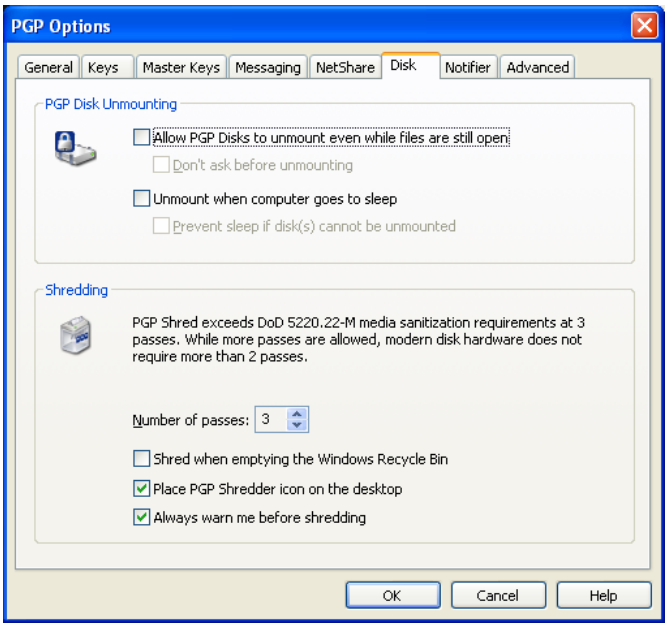
  Note: You may be prevented from selecting this option by your PGP administrator if you are using PGP Desktop in a PGP Universal Server-managed environment.

For more information about protecting individual files that are outside of Protected Folder using PGP NetShare, see *Protecting Files Outside of a Protected Folder* (on page 238).

Disk Options

The Disk tab contains settings that apply to volumes protected using the PGP Virtual Disk feature. The Disk tab also shows options for PGP Shredder.

Note: If you are using PGP Desktop in a PGP Universal Server-managed environment, your PGP Universal Server administrator may have disabled certain features. When a feature is disabled, the control item in the left side is not displayed and the menu and other options for that feature are not available. The graphics included in this guide depict the default installation with all features enabled. If your PGP Universal Server administrator has disabled this functionality, this section does not apply to you.


PGP Options
General
Keys
Master Keys
Messaging
NetShare
Disk
Notifier
Advanced
PGP Disk Unmounting
Allow PGP Disks to unmount even while files are still open
Don't ask before unmounting
Unmount when computer goes to sleep
Prevent sleep if disk(s) cannot be unmounted
Shredding
PGP Shred exceeds DoD 5220.22-M media sanitization requirements at 3 passes. While more passes are allowed, modern disk hardware does not require more than 2 passes.
Number of passes: 3
Shred when emptying the Windows Recycle Bin
Place PGP Shredder icon on the desktop
Always warn me before shredding
OK
Cancel
Help

Note: If you are using PGP Desktop in a PGP Universal Server-managed environment, these options may already be configured.

PGP Disk Unmounting

The options for PGP Virtual Disk are:

- **Allow PGP Virtual Disks to unmount even while files are still open.** Normally, you cannot automatically unmount a PGP Virtual Disk volume if any of the files in that volume are open. Enabling this option allows unmounting even with open files (called a forcible unmount).
  - **Don't ask before unmounting** allows PGP Desktop to forcibly unmount a PGP Virtual Disk volume *without* first warning you of any files that may be open.

  Warning: You may lose data if you forcibly unmount a PGP Virtual Disk volume with open files.

- **Unmount when computer goes to sleep.** When enabled, PGP Desktop will automatically unmount any mounted PGP Virtual Disk volumes when your computer goes into any sleep modes; Standby or Hibernate, for example.

- Select **Prevent sleep if disk(s) cannot be unmounted** to prevent your computer from sleeping if a PGP Virtual Disk can not be unmounted. This option is unavailable on Microsoft Windows Vista systems (Windows Vista no longer allows applications to prevent sleep).

Warning: The Windows Hibernate mode is inherently insecure, because Windows writes sensitive data to disk if your PGP Virtual Disk is open when hibernation is invoked. PGP Corporation recommends using the PGP Whole Disk Encryption feature if you use Hibernation; otherwise be sure to enable the **Unmount when computer goes to sleep** and **Prevent sleep if disk(s) cannot be unmounted** options.

Shredding

The PGP Shredder feature offers a secure way for you to delete sensitive files. You can adjust the level of security the PGP Shredder feature offers, as well as other settings.

The options for the PGP Shredder feature are:

- **Number of passes.** The PGP Shredder feature removes your file(s) securely by deleting them normally, then using numerous "0" characters to overwrite the disk space that had been occupied by the files you just deleted.

  Using this method, your files can be deleted very securely with only a few overwriting "passes." For this reason, a setting of **3** is the default, and offers an extremely high level of security, but you can adjust this setting to reflect the level of security that you desire by changing this setting (to a maximum of 49 passes).

  Be aware that the cost of added security is increased time needed to shred your file(s), depending on several factors, particularly the speed of your computer's processor.

  The recommended guidelines for number of passes are:

  - 3 passes for personal use.
  - 10 passes for commercial use.
  - 18 passes for military use.
  - 26 passes for maximum security.

- **Shred when emptying the Windows Recycle Bin.** Select this checkbox to set the PGP Shredder feature to shred the contents of the Windows Recycle Bin whenever it is emptied. Use this option with care, as the PGP Shredder feature shreds all files in the Recycle Bin, whether sensitive or not, which can take time with very large files.

  This option also automatically shreds files that you delete by bypassing the Recycle Bin (by holding down the Shift key when deleting the item), as well as System and Application "temp" files that are deleted automatically by the operating system.

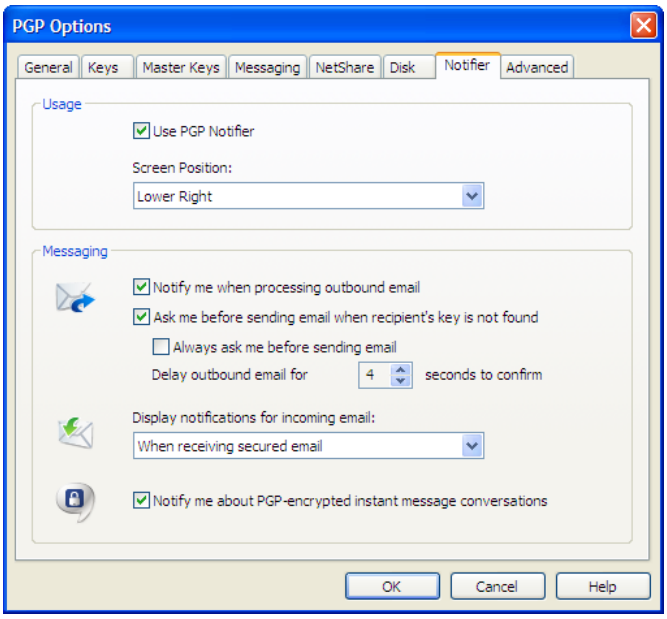
This automatic shredding provision uses the PGP Shredder feature settings that you have chosen, just like it does when you shred files manually.

- **Place PGP Shredder icon on the Desktop.** Select this checkbox if you would like to place an icon for the PGP Shredder feature conveniently on your computer's Desktop. Use this icon just as you do the Windows Recycle Bin icon: drag files into it. This option is selected by default.
- **Always warn me before shredding.** Select this checkbox if you would like a confirmation dialog box to appear before any shredding takes place. This gives you a chance to double-check that only the files you intended are the ones that are shredded. This option is selected by default.

Tip: Please consider other occurrences of the data that might linger elsewhere on your disk, such as temp files. For this reason, consider using PGP Whole Disk Encryption to protect all data on your system.

Notifier Options

The **Notifier** tab contains settings that apply to the PGP Desktop Notifier feature, which displays status messages in a corner of your screen when you send or receive email messages. It also displays status messages when you use the PGP Whole Disk Encryption and the PGP NetShare features.



For more information on the PGP Desktop Notifier feature, see *PGP Desktop Notifier alerts.* (see "PGP Desktop Notifier alerts" on page 34)

Usage Options

- To enable notifiers, select **Use PGP Notifier**, then specify the **Screen Position**.
- **Screen Position:** PGP Desktop Notifications can appear at any of the four corners of your screen **(Lower Right**, **Lower Left**, **Upper Right**, or **Upper Left**). Select the corner that you want PGP Desktop Notifications to appear. The default position is **Lower Right**.

Messaging Options

The settings for the PGP Desktop Notifier feature are:

- **Notify when processing outbound email:** Select this checkbox if you want PGP Desktop Notifiers to appear, informing you of encryption and/or signing status when you send mail. Deselect this checkbox to stop PGP Desktop Notifiers from appearing when you send mail.
- **Ask me before sending email when the recipient's key is not found:** PGP Desktop looks for a public key for every recipient of the email messages that you send. By default, if it cannot find a public key for a recipient, it sends that email in the clear (without encryption). If you select this Notifier option, you are notified that this is the case, and given a chance to block the email so that it is not sent.

  (For more information on the PGP Desktop default policy settings, see *Services and Policies* (on page 91).)

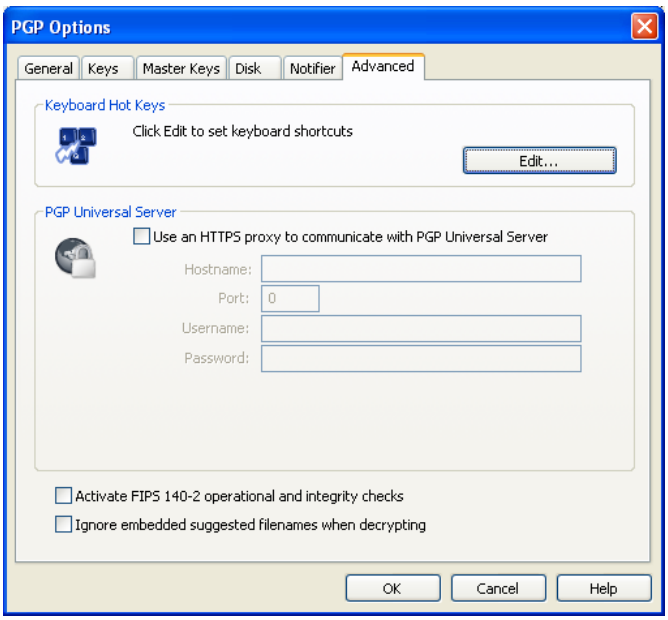
  - **Always ask me before sending email:** You can select this checkbox if you would prefer approving every email that you send. You can review the encryption status in the Notifier, and either send or block the email.
  - **Delay outbound email for n second(s) to confirm** (where *n* is a number from 1-30; the default is 4 seconds). To change the amount of time that outbound messages are delayed, and a PGP Desktop Notifier is displayed, click the up or down arrows. Use the delay period to review the PGP Desktop Notifier message.
- **Display notifications for incoming mail:** For incoming email, you can choose the extent to which you are notified of its status upon arrival. Your choices are:
  - **When receiving secured email**—A Notifier is displayed whenever you receive secured email. The box displays who the email is from, its subject, its encryption and verification status, and the email address of the person sending it.
  - **Only when message verification fails**—For incoming email, you see a Notifier only when PGP Desktop is unable to verify the signature of the incoming email.

- **Never**—If you do not need or want to see a Notifier as you receive email, select this option. This option does not affect Notifiers for outgoing mail.

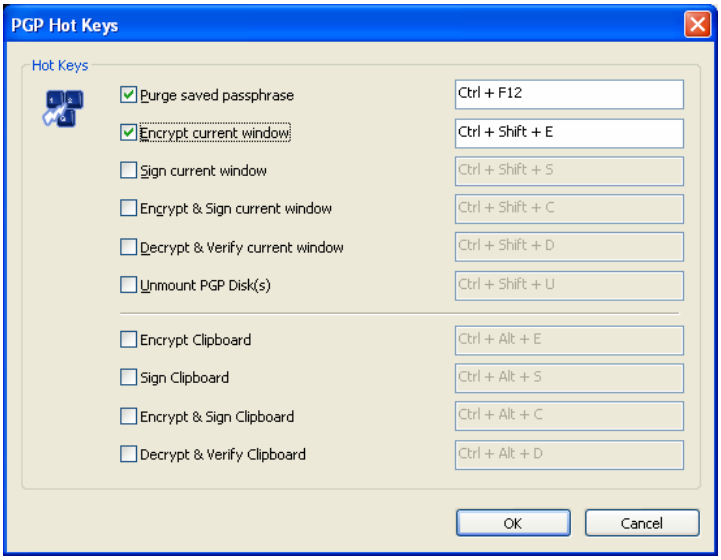
- **Notify me about PGP Encrypted instant message conversations**—Select this checkbox if you want a PGP Desktop Notifier to appear briefly when you begin a secure instant message chat, and appear briefly again when the chat ends.

Advanced Options

The PGP Options Advanced settings tab provides settings that are very specific. Most users do not need to change these settings.



- **Keyboard Hot Keys**. PGP Desktop offers many ways you can create custom hot keys to help you work faster and more easily. A set of hot keys comes pre-configured with PGP Desktop, but you can change these hot key assignments to suit your needs. Click **Edit** to display the PGP Hot Keys dialog box.



- **PGP Universal. Use an HTTPS proxy to communicate with PGP Universal.** Do not change these settings unless you are instructed to by your network administrator.

  If your PGP Universal Server installation requires a secure client/server connection via a proxy, you can use these option settings to specify that. Your administrator can supply you with the server name, the correct communications port, your user ID, and your password, so you can configure this section correctly.

- To change your key (or key mode), click **Reset Key**. For more information on key modes, see *Key Modes* (on page 120). This option is available only if you are using PGP Desktop in a PGP Universal Server-managed environment.

- **Activate FIPS 140-2 operational and integrity checks.** Select this option if you or your organization require FIPS 140-2 checks, but be aware that it slows down your computer's performance. You must reboot your computer for this setting to take effect. This option is available only in standalone installations.

- **Ignore embedded suggested filenames when encrypting**. Select this option to ignore suggestions PGP Desktop makes when encrypting files.

If you are using PGP Desktop version 8.1 in a international setting (such as Japan), PGP Desktop incorrectly encodes the suggested file name. This setting must be checked for proper interaction between PGP Desktop 8.1 and 9.x when decrypting files in PGP Desktop 9.x that were encrypted with PGP Desktop 8.1.

B Working with Passwords and Passphrases

Passwords and passphrases are used to protect things. In general, passphrases are longer and use a wider variety of characters than do passwords.

For example, a simple password might be four-letter two words concatenated: "whenjobs" without the quotes. A stronger password could use uppercase characters as well: WhenJobs. A stronger yet password could add numbers: When9Jobs4.

Passphrases, in comparison, are longer and use a wider variety of characters. For example, a simple passphrase might be: "Mb&1a>ttA." without the quotes, but including the period. This passphrase might seem difficult to remember easily, but in fact it's based on a simple phrase that is much easier to remember.

Passphrases can also be simple phrases, perhaps from a familiar book, that include the punctuation and capitalization: "Because that's not golf, I replied" including the quotes. Although this may not seem like a strong passphrase, it is in fact at least twice as strong as any of the other examples.

This section describes the differences between passwords and passphrases, tells you about the Passphrase Quality Bar in PGP Desktop, and provides some guidelines for creating strong passphrases.

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The Passphrase Quality Bar 304
Creating Strong Passphrases 305
What if You Forget Your Passphrase? 307

Choosing whether to use a password or passphrase

So how do you know whether to choose a password or a passphrase? It depends on what you are trying to protect. The more valuable the information you are protecting, the stronger the protection should be.

Most Word documents are not protected at all; the content is not valuable enough to justify the effort. When you access your bank account online, some banks require only a four-letter PIN; depending on the amount of money in that account, this very well may be very poor security. You may use a free Hotmail email account for unimportant correspondence; a simple password is adequate security. With your corporate email account you send and receive proprietary product, customer, or financial information.

With PGP Desktop, for example, you create passphrases for both your PGP keypair and for your PGP Virtual Disk volumes. If you create a weak passphrase for your PGP keypair, and an attacker managed to get physical control of your private key file, all they would need to do to be able to read your messages and send messages that appear to be coming from you would be to figure out that passphrase.

The Passphrase Quality Bar

When you create passphrases in PGP Desktop, the Passphrase Quality bar provides a basic guideline for the strength of the passphrase you are creating. Nevertheless, it is a much better guideline than just number of characters.

In general, the longer the bar, the stronger the passphrase. But what does the length of the Passphrase Quality bar actually mean?

The Passphrase Quality bar compares the amount of randomness (entropy) in the passphrase you enter against a true 128-bit random string (the same amount of entropy in an AES128 key). This is called 128 bits of entropy.

(Entropy is a measure of the difficulty in determining a password or key.)

So if the passphrase you create fills up approximately half the Passphrase Quality bar, then that passphrase has approximately 64 bits of entropy. And if your passphrase fills the Passphrase Quality bar, then that passphrase has approximately 128 bits of entropy.

So how strong is 128 bits of entropy? In the late 1990s, specialized "DES cracker" computers were built that could recover a DES key in a few hours by trying all possible key values.

Assuming you could build a computer that could recover a DES key in one second (the computer would have to be able to try 255 keys per second), then it would take that computer approximately 149 trillion (thousand billion) years to crack one 128-bit AES key. In comparison, the universe is believed to be less than 20 billion years old.

How is the entropy of a particular character measured? The answer is, the bigger the pool of characters there is to choose from when picking a particular character, the more entropy is assigned to the chosen character.

For example, if you are told to choose a numeric PIN, you are restricted to the numbers zero through nine; a total of 10 characters. This is a rather small pool, so the entropy for a chosen character is relatively low.

When you are choosing a passphrase using the English version of PGP Desktop, however, things are different. You have three pools of characters to choose from: uppercase and lowercase letters (52 characters), numbers zero through nine (10 characters), and the punctuation characters on a standard keyboard (32 characters).

When you enter a character, PGP Desktop determines the entropy value for that character based on the pool it is in and applies that value to the Passphrase Quality bar.

The same concept applies to the character sets of other languages; the larger the pool, the more entropy per character. So if you were using an Asian or Arabic character set, for example, some of which have hundreds of characters in the set, the amount of entropy for a selected character would be correspondingly higher, and thus fill up the Passphrase Quality bar that much faster.

Creating Strong Passphrases

Creating a good passphrase is a trade-off between ease of use and strength of the passphrase. Longer passphrases, with a mixture of uppercase and lowercase letters, numbers, and punctuation characters, are stronger, but they are also harder to remember.

Studies have shown that passphrases that are harder to remember are more frequently written down, which defeats the purpose of having a strong passphrase. It's better to have a somewhat shorter strong passphrase that you will remember than a longer strong passphrase that you will write down or forget.

One common system for generating strong passphrases takes a phrase and reduces it to individual characters. For example, the phrase:

```
My brother and I are greater together than apart.
```

becomes the passphrase:

```
Mb&1a>ttA.
```

This passphrase has 10 characters, and is a mix of uppercase and lowercase letters, numbers, and punctuation characters. At 10 characters, this is a relatively short passphrase. If you think 10 characters is not enough, consider either creating another passphrase using the same method and then use both together or simply use a longer phrase to start with.

Another approach is to use simple phrases that include punctuation and capitalization. For example:

```
Edited by John Doe (not John Doe, Editor)
```

While not overly long or complicated, this is a strong passphrase. If you decide to use a phrase from a familiar book, make sure not to lose the book.

When creating a passphrase in PGP Desktop, you can use up to 255 characters, including spaces.

Another approach is to concatenate many short, common words. A method called Diceware™ uses dice to select words at random from a special list called the Diceware Word List, which contains 7776 short English words, abbreviations, and easy-to-remember character strings. If you put together enough of these, you can create a strong passphrase. The Diceware FAQ states you may achieve 128 bits of entropy using a 10-word Diceware passphrase.

For more information about Diceware, see the *Diceware Passphrase Home Page* (http://world.std.com/~reinhold/diceware.html).

When it comes to creating passphrases, here are some things you should do:

- Use a phrase that is in your long-term memory. You are less likely to forget it that way.
- Make your passphrase at least eight characters long. Length is not the best indicator of strength, but it's still better than shorter.
- Use a mixture of uppercase and lowercase letters, numbers, and punctuation characters.

  Caution: Try to use only ASCII characters, if possible. This is particularly important when using international keyboards, as some special characters are not supported (for example, "§") in passphrases.

- Change your passphrase on a regular basis; every three months is a good rule of thumb. The longer you use the same passphrase, the more time there is for someone to figure it out.

Here are some things you should **not** do when creating passphrases:

- Do not write down your passphrase.
- Do not give your passphrase to anyone.
- Do not let anyone see you entering your passphrase.
- Do not use "password" or "passphrase."
- Do not use patterns. Not "abcdefgh" or "12345678" or "qwertyui" or "88888888" or "AAAAAAAA."
- Do not use common words. Almost any skilled attacker is using a password-cracking dictionary that tries regular words. Don't put two common words together, don't use the plural of a common word, don't use a common word with the first letter capitalized.
- Do not use numbers that pertain to you. If anyone knows these numbers, then an attacker could find out. Don't use your birthday, your phone number, your social security number, or your street address.
- Do not use names. Not the names of people, not the names of fictional characters, not your pet's name. Not where you vacationed last winter, not your login name, not your company's name. Not your favorite team's name, not a body part, not a name from any book, especially the Bible.

- Do not use any of the above backwards, or with a preceding or following single digit.

What if You Forget Your Passphrase?

If you forget your passphrase, you will never again be able to decrypt any information encrypted to your key. You can, however, reconstruct your key if your PGP administrator has implemented a key restoration policy for your company. For more information, see *PGP Key Reconstruction* (see "Reconstructing Keys with PGP Universal Server" on page 79, "If You Lost Your Key or Passphrase" on page 78) and contact your PGP administrator.

C Using PGP Desktop with PGP Universal Server

PGP Universal Server allows enterprises to automatically and transparently (to end users) protect email messages based on configurable policies the PGP administrator establishes to enforce the organization's security policies. PGP Universal also lets PGP administrators manage PGP Desktop deployments to users in their organization. For more information about the PGP Universal Server, see *PGP Universal Server on the PGP website* (http://www.pgp.com/products/universal/index.html).

Using PGP Desktop in a PGP Universal Server-managed environment gives you proven PGP encryption technology all the way to your desktop, plus the other security features in PGP Desktop: PGP Whole Disk Encryption, PGP Virtual Disk volumes, PGP Zip archives, and PGP Shred, among others.

To use PGP Desktop in a PGP Universal Server-managed environment, you must install PGP Desktop using an installer application you receive from your PGP administrator.

If you are using a version of PGP Desktop you purchased for home use, and are not using it in a corporate environment, you are likely using a standalone version, and this section does not apply to you.

Caution: If you are using PGP Desktop in a corporate environment and you obtained your PGP Desktop installer from a different source other than your PGP administrator, you should check with your PGP administrator **before** installing or using that version of PGP Desktop.

This section describes how using PGP Desktop is different in a PGP Universal Server-managed email domain.

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Overview

Your PGP Desktop installer will have been configured by your PGP administrator in one of the following ways:

- **No policy settings**. Your copy of PGP Desktop will not have any built-in settings; you can use any feature your license supports.
- **Auto-detect policy settings**. Your copy of PGP Desktop will contact the PGP Universal Server that created the installer and download the appropriate settings. The settings it receives may require you to use PGP Desktop features in specific ways.
- **Preset policy settings**. Your copy of PGP Desktop will have the appropriate settings built in. These settings may require you to use PGP Desktop features in specific ways.

The result of your copy of PGP Desktop receiving settings from a PGP Universal Server means you may have to use PGP Desktop features in specific ways. This includes:

- You may have to take certain actions when you install PGP Desktop: you may have to whole disk encrypt your boot drive or create a PGP Virtual Disk volume, for example.
- You may be allowed or required to use PGP Desktop features in certain ways: you may be required to encrypt your AIM instant messaging sessions or you may be allowed to automatically shred files when deleting them, for example.
- You may be prevented from using certain PGP Desktop features: you may be prevented from using conventional encryption and creating self-decrypting archives (SDAs), for example.
- You may be required to use to certain messaging policies: you may have to encrypt and sign messages to certain email domains, for example.
- You may have certain features disabled, such as PGP Messaging or PGP NetShare (on Windows systems), or you may have a customized PGP Whole Disk Encryption BootGuard screen (on Windows systems). For more information, see *Features Customized by Your PGP Universal Server Administrator* (on page 5).

Those features of PGP Desktop that can be managed by a PGP administrator in a PGP Universal Server-managed environment are noted in their descriptions throughout this User's Guide.

Contact your PGP administrator for more information about the differences when using PGP Desktop in a PGP Universal Server-managed environment.

For PGP Administrators

If you are a PGP administrator managing the rollout of PGP Desktop to some or all users in your organization, PGP Corporation recommends you allow your PGP Desktop users to manage their own keys, called Client Key Mode.

When you are preparing to create the PGP Desktop installers on your PGP Universal Server, you can control whether your PGP Desktop users are able to manage their own keys, Client Key Mode, or whether the PGP Universal Server will manage their keys, called Server Key Mode.

These settings are established in the Key Management section of the Key Setup: Default screen, which is part of the configuration of the default user group policy for internal users (**User Group > Policy Options > Key Setup: Default** in the PGP Universal Server's administrative interface).

For PGP Desktop users, Client Key Mode is the better choice because:

- Many PGP Desktop features require the user to have control of their private key. If the PGP Universal Server is managing that private key, those features will be unavailable to your PGP Desktop users.
- If you specify Server Key Mode, certain options you pre-configure for your PGP Desktop users will not be available. For example, the automatic creation of PGP Virtual Disks is not possible.

Manually binding to a PGP Universal Server

If you manually bind to a PGP Universal Server using PGP Desktop (when viewing a Messaging Service, click **Server Settings**) and enroll, you will download only the email policy and not the consumer policy. Your PGP Universal Server administrator may have specified other options in the consumer policy (such as key modes, forcing the encryption of disks, and so on). To be fully managed and enforce consumer policy you need to use a PGP Universal Server "stamped" installation. Contact your administrator to obtain a stamped installation if you do not have one.

In addition, when you manually bind to a PGP Universal Server, the file `PGPtrustedcerts.asc` does not exist in C:\Documents and Settings\AllUsers\Application Data\PGPCorporation\PGP. If you want to manually bind to a PGP Universal Server, you will need to create this file and ensure that the user ID of the organization key in that file matches the server specified by the PGPSTAMP (the domain name and IP address must match).

D Using PGP Desktop with IBM Lotus Notes

This section describes use of PGP Desktop with Lotus Notes, including MAPI.

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Binding to a PGP Universal Server 315
Notes Addresses 316
Notes Client Settings 316
Using Lotus Notes Native Encryption 317

About Lotus Notes and MAPI Compatibility

Once set up correctly, PGP Desktop messaging with Lotus Notes and MAPI email clients in a PGP Universal-protected environment works the same as with POP or IMAP email clients, as described in *Securing Email Messages* (on page 85). The information in this appendix supplements the information in that chapter.

Lotus Notes is a groupware application that provides messaging, calendaring, and scheduling capabilities. Refer to the *PGP Desktop for Windows Release Notes* for information on compatible Lotus Notes email clients.

MAPI (Messaging Application Programming Interface) is a messaging architecture and a client interface used in Microsoft Exchange environments.

Lotus Notes and MAPI compatibility in PGP Desktop means you get your messaging protected by PGP technology while using your existing email client, plus the other features Lotus Notes and MAPI make available to you.

PGP Desktop installation is compatible with both Lotus Notes Single-User and Multi-User installation.

Using PGP Desktop with Lotus Notes

This section provides an overview of the interoperability of PGP Desktop and PGP Universal in a Lotus Notes environment.

Sending email to recipients inside your Lotus Notes organization

Within the Lotus Notes environment PGP Desktop supports the use of both SMTP and Notes addressing.

Using Notes Addresses

Lotus Notes clients using PGP Desktop can use Notes addresses for key lookup. When a Lotus Notes email client sends an email, the PGP Desktop client recognizes this and automatically adds the Notes address to the key. This key is then synchronized with PGP Universal to facilitate the lookup of keys by Notes address.

All PGP Universal Server keys have an SMTP email address associated with them (for example, josem@example.com). The keys of internal Lotus Notes email client users have their Notes address on their key in addition to a SMTP email address: CN=josem/O=notes6@notes6, for example. (External users will never have a Notes address on their key, as contact with external users is always using their SMTP email addresses.) The keys of internal Lotus Notes email client users have both addresses, the SMTP email address and the Notes address, because requests for the key from PGP Universal Satellite for Windows could specify either address.

Using SMTP Addresses to a recipient with PGP Desktop

Lotus Notes clients using PGP Desktop can use SMTP IDs for key lookup inside the organization. Some Lotus Notes enterprises utilize SMTP IDs for all internal communication, while others offer their employees a choice. PGP Desktop interoperates within both configurations. In this scenario Lotus Notes typically constructs the email in MIME and the PGP Desktop Proxy performs S/MIME.

Sending email to recipients outside your Lotus Notes organization

Lotus Notes clients using PGP Desktop will use SMTP IDs for email routing and key lookup outside the organization. PGP Desktop interoperates within both configurations. In this scenario Notes constructs the email in MIME and the PGP Desktop proxy performs S/MIME or PGP/MIME. The recipient receives and decrypts the email.

Binding to a PGP Universal Server

When using Lotus Notes or MAPI email clients with PGP Desktop *in a PGP Universal-protected environment*, there may be an extra setup step required because both Lotus Notes and MAPI email clients must directly connect to their Domino or Exchange mail servers, respectively.

This section does not apply if you are using PGP Desktop standalone; that is, outside of a PGP Universal Server-managed environment.

In addition to communicating with you mail servers, you must also have a relationship with your PGP Universal Server. Both requirements are met by having a policy for the respective mail server and a second policy that includes both the mail server and the PGP Universal Server.

This is called binding, and it allows your email client to access its mail server to send and receive mail and its PGP Universal Server to get keys and policies. As mentioned, binding is achieved through PGP Desktop messaging policies.

There are two ways the necessary PGP Desktop messaging policies can be created to support binding: pre-binding and manual binding.

Pre-Binding

With pre-binding, the PGP administrator configures the PGP Desktop installer with the information needed to create the binding in the PGP Desktop messaging policies. So with pre-binding, the right policies come configured in PGP Desktop.

Manual Binding

With manual binding, the PGP administrator does not configure the PGP Desktop installer with the information needed to create the binding in the PGP Desktop messaging policies; you have to create these policies yourself.

To manually bind a mail server and a PGP Universal Server, you must first create a service for the PGP Universal Server and then create another service for the mail server that includes a reference to the PGP Universal Server.

▸ **To manually bind a mail server and a PGP Universal Server using PGP Desktop messaging policies**

1. Open PGP Desktop.
2. Click the PGP Messaging Control Box.
3. Under existing standalone service, click **Universal Server <none>** and select **Create new.**

4 In the New PGP Universal Service menu, type your Universal Server name and click **OK.**

5 Using your email client, send yourself a message. For MAPI users, doing this may not be necessary. If not, go to step 8.

6 Click **OK** on the **Operation stopped by your request** dialog box.

7 From your in-box, read the email from "PGP Universal." The PGP Key Generation Wizard dialog box is displayed.

8 Click **Next.**

9 Choose a **Key Mode** from the **Key Management Selection,** then click **Next.**

10 In **Key Source Selection,** choose **PGP Desktop key,** if you are using PGP Desktop as a standalone application. Otherwise, select **New key** or **Import Key.**

11 Click **Next.**

12 Select the key set and click **Next**.

13 Click **Finish.**

Notes Addresses

PGP Desktop keys generally have at least one SMTP email address associated with them: josem@example.com, for example.

The PGP Desktop keys of Lotus Notes email client users in a PGP Universal Server-managed environment may have their Notes address on their key in addition to a SMTP email address: `CN=josem/O=notes6@notes6`, for example. (Standalone PGP Desktop users do not have a Notes ID on their key; they always use their SMTP email addresses.)

If you are using PGP Desktop and a Lotus Notes email client in a PGP Universal Server-managed environment and want to know more information, contact your PGP administrator.

Notes Client Settings

If you are using PGP Desktop with a Lotus Notes email client, you need to make sure that on the Home/Mail Server Setting field of your email client's location record, the Servers tab has the full Notes name (host/orgName), and not just the WINS host.

PGP Corporation recommends that you fill in the **Internet mail address** field on the Basics tab of the current Location document. OCNOTES relies on this field to determine the user's SMTP email address. If the field is missing, PGP Desktop constructs an SMTP email address for the user based on the Domino Server's Global Domain document.

If you are in "Island mode" and PGP Desktop fails to look up keys for some or all recipients, PGP Desktop tries to encrypt the message again by looking for keys when the replicator pushes the message to your home server.

If PGP Desktop fails to look up a key for some recipients and the Notes native encryption option is checked, PGP Desktop allows the Lotus Notes client to encrypt the message to the recipients which PGP failed to encrypt.

The Notes.ini Configuration File

PGP Desktop updates the `notes.ini` configuration and adds the following entry:

```
EXTMGR_ADDINS=nPGPNote.dll
```

Be sure that this entry is not modified or removed. PGP Desktop scans the `notes.ini` file every time it starts. If this entry is missing, it will add the entry again.

Using Lotus Notes Native Encryption

Lotus Notes Native Encryption enables Notes users to send internal email encrypted to the user's Notes key. When PGP Desktop is configured to use Notes native encryption, confidential information can be sent encrypted to internal users by selecting a checkbox when composing the message. All Lotus Notes users have a Notes key.

If the email address in the To: field matches the Lotus Notes format (CN=Alice Cameron/O=Example Corp) and Notes native encryption is enabled, PGP Desktop allows the email to be sent encrypted using Lotus Notes. If the email address in the To: field is an SMTP address (acameron@example.com), PGP Desktop encrypts the email to your PGP key.

Notes Native Encryption is available for both PGP Universal Server-managed environments as well as standalone environments. To enable Notes Native Encryption in a standalone environment, see *PGP Support KB article 1613* (https://support.pgp.com/?faq=1613).

PGP Desktop applies the messaging policies for Sign and Encrypt Buttons to all outgoing Lotus Notes messages when the options to Sign and/or Encrypt have been selected. For information on these policies, see *Security Policy Information and Examples* (on page 108). If the policies do not exist in your standalone environment, you will need to create them.

To use Notes native encryption

1. Compose the message in Lotus Notes.
2. Select the boxes for **Sign** and/or **Encrypt** in the message toolbar (if available in the template). If not, choose Delivery Options and under the Security Options section, select the boxes for **Sign** and/or **Encrypt**.

   Note: These boxes must be selected each time you want to send an email using Notes native encryption.

3. Send the message.
   - If mail policy is set to encrypt and the email recipient is a Notes user, the message is sent encrypted using Notes native encryption. Click **More** on the notifier message to verify the message is processed and encrypted using Lotus Notes. When the recipient opens the message, there is no PGP annotation included.
   - If mail policy is set to encrypt and the email recipient is an SMTP address, PGP Desktop looks up the PGP key and the message is sent encrypted using PGP Desktop. When the recipient opens the message, the standard PGP annotation is included.
   - If mail policy is set to encrypt and the email recipient is an SMTP address and you are connected to the Lotus Notes Domino server, Lotus Notes tries to resolve the SMTP address to the Lotus Notes address. If successful, the message is then sent using Notes native encryption. Click **More** on the notifier message to verify the message is processed and encrypted using Lotus Notes. When the recipient opens the message, there is no PGP annotation included.
   - If mail policy is set to sign, Lotus Notes signs the message with the senders Notes key. No encryption occurs using Lotus Notes or PGP Desktop. Note that if the box to **Sign** the message is not selected, PGP Desktop signs the message using the sender's PGP key.

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